MERRIAM MOUNTAINS SPECIFIC PLAN

APPENDIX L

NOISE IMPACT ANALYSIS

GPA 04-06; SP 04-006; R04-013; VTM5381; S04-035, S04-036, S04-037, S04-038; Log No. 04-08-028; SCH No. 2004091166

for the

RECIRCULATED ENVIRONMENTAL IMPACT REPORT

March 2009

Note: Comments will be accepted on the entire appendix.

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NOISE IMPACT ANALYSIS

for the

MERRIAM MOUNTAINS SPECIFIC PLAN

SP04-006, GPA04-006, R04-013, TM5381,
S04-035, S04-036, S04-037S, 04-038
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EXECUTIVE SUMMARY

This acoustical analysis is provided for the proposed Merriam Mountains Specific Plan Area project located within the County of San Diego. The site is located near the northwest corner of Interstate 15 and Deer Springs Road. The Merriam Mountains Specific Plan Area project would include residential, commercial and park uses.

The proposed residential land uses would be subject to traffic noise from Interstate 15 and several planned roads. Additional noise impacts could result from short-term construction impacts, a new access road, additional project-generated traffic and commercial uses.

The site is currently subject to vehicular noise levels in excess of the County's residential exterior 60 dB CNEL noise guideline adjacent to portions of Interstate 15 and Deer Springs Road. In the future, residential lots adjacent to Interstate 15, Deer Springs Road, Merriam Mountains Parkway and Meadow Park Lane would be subject to noise levels which exceed the County's noise guideline due to vehicular traffic along the roads. Preliminary noise abatement measures have been identified to mitigate the potential noise impacts..

The project would widen Deer Springs Road and Twin Oaks Valley Road from approximately 1,000 feet south of Cassou Road to Interstate 15 resulting in significant noise impacts at several single family residences and a mobile home park. Sound walls ranging from six to eight-feet in height would mitigate the noise impact.

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1.0 INTRODUCTION

The Merriam Mountains Specific Plan Area (Merriam SPA) consists of approximately 2,327 acres located within the Merriam Mountains of northern San Diego County. The site is bounded by Interstate 15 (I-15) on the east, Deer Springs Road (S12) on the south, and Twin Oaks Valley Road on the west, with a small portion of the western edge of the site traversed by Twin Oaks Valley Road, and the northeast corner of the site traversed by Lawrence Welk Drive. Gopher Canyon Road is located approximately one mile north of the site (Figures 1 and 2).

This noise report evaluates long-term noise impacts associated with traffic at the site and project-generated off-site traffic, and commercial uses. Short-term construction noise impacts are also evaluated. The noise impacts are assessed based on County of San Diego noise criteria.

2.0 PROJECT DESCRIPTION

The Merriam SPA proposes to develop a master-planned community integrating residential, commercial, recreational and open space land uses. The Merriam SPA will allow a maximum of 2,700 dwelling units on the 2,320-acre SPA. A Vesting Tentative Map (TM 5381) of the Merriam SPA, including potential offsite improvements for roadways, intersections, and utilities is depicted in Figure 3. The Vesting Tentative Map also provides for a grading plan, an internal circulation system, a drainage system, and a utility plan that includes two water storage tanks, and a brush management plan.

The Specific Plan will include policies and programs for the preservation and ongoing viability of the natural open spaces and direction f the development of the residential units 10.1 acres of neighborhood commercial, recreational uses, and associated community facilities and infrastructure.

3.0 NOISE CRITERIA

The County of San Diego typically describes community noise levels in terms of the Community Noise Equivalent Level (CNEL). CNEL is the average A-weighted sound level during a 24-hour day. It is obtained after adding five decibels (dB) to sound levels in the evening hours (7:00 p.m. to 10:00 p.m.) and adding ten dB to the sound levels at night (10:00 p.m. to 7:00 a.m.). The five and ten dB penalties are applied to account for increased noise sensitivity during the evening and nighttime hours. The A-weighted scale measures noise levels corresponding to the human hearing frequency response. All sound levels discussed in this report are A-weighted. The acoustical terminology used in this report is defined in *Attachment 1*.

County General Plan Noise Element and Planning Department Noise Criteria

The County has established exterior noise guidelines in the noise element of the County's adopted General Plan (County of San Diego 2006). These guidelines identify compatible exterior noise levels for various land use types. The maximum acceptable exterior noise level for residential development is 60 dB CNEL. This criterion is applied at the outdoor noise sensitive area. In addition, the County requires that interior noise levels not exceed a CNEL of 45 dB.

Applicable to this project, Chapter 4 Policy 4b of the County's Noise Element states that:

> *If the acoustical study shows that noise levels at any noise sensitive land use will exceed CNEL equal to 60 decibels, modifications shall be made to the development which reduce the exterior noise level to less than 60 dB CNEL and the interior noise level to less than 45 dB CNEL.*
>
> *If modifications are not made to the development in accordance with the above paragraph, the development shall not be approved unless a finding is made that there are specifically identified overriding social or economic considerations which warrant approval of the development without such modification: provided, however, if the acoustical study shows the sound levels for any noise sensitive land use will exceed a 75 dB CNEL even with such modifications, the development shall not be approved irrespective of such social or economic considerations.*

"*Development*" means any physical development including but not limited to residences, commercial, or industrial facilities, roads, civic buildings, hospitals, schools, airports, or similar facilities.

For single family detached dwelling projects, "*exterior noise*" means noise measured at an outdoor living area which adjoins and is on the same lot as the dwelling, and which contains at least the following minimum area:

(i)	Net lot area up to 4,000 square feet:	400 square feet
(ii)	Net lot area 4,000 square feet to 10 acres	10% of net lot area
(iii)	Net lot area over 10 acres:	1 acre

For all other projects "*exterior noise*" means noise measured at all exterior areas which are provided for group or private usable open space purposes.

"*Group or Private Usable Open Space*" shall mean: Usable open space intended for common use by occupants of a development, either privately owned and maintained or dedicated to a public agency, normally including swimming pools, recreation courts, patios, open landscaped areas, and greenbelts with pedestrian walkways and equestrian and bicycle trails, but not including off-street parking and loading areas or driveways (Group Usable Open Space): and usable open space intended for use of occupants of one dwelling unity, normally including yards, decks and balconies (Private Usable Open Space).

"*Noise sensitive land use*" means any residence, hospital, school, hotel, resort, library or any other facility where quiet is an important attribute of the environment.

The County Department of Planning and Land Use also utilize a noise criterion for evaluating off-site noise impacts to residences or noise sensitive areas from project-related traffic. The County considers such impacts to be significant when they exceed three dB CNEL and either elevate noise levels above 60 dB CNEL or exceed a three dB increase above an already noisy existing condition (i.e., 60 dB CNEL).

A noise impact is also considered significant if project implementation will produce additional noise which will cause any onsite or off-site, noise sensitive area to experience an increase in noise of 10 dB CNEL or more.

Additional significance criteria used by the County are depicted in Table 1.

Table 1
Guidelines of Significance for Ground-Borne Vibration and Noise Effects

Land Use Category	Ground-Borne Vibration Impact Levels (inch/sec rms)		Ground-Borne Noise Impact Levels (dB re 20 micro Pascals)	
	Frequent Events[1]	Infrequent Events[2]	Frequent Events[1]	Infrequent Events[2]
Category 1: Buildings where low ambient vibration is essential for interior operations. (research & manufacturing facilities with special vibration constraints)	0.0018[3]	0.0018[3]	Not applicable	Not applicable
Category 2: Residences and buildings where people normally sleep. (hotels, hospitals, residences, & other sleeping facilities)	0.0040	0.010	35 dBA	43 dBA
Category 3: Institutional land uses with primarily daytime 0.0018use. (schools, churches, libraries, other institutions, & quiet offices)	0.0056	0.014	40 dBA	48 dBA

Table 1
Guidelines of Significance for Ground-Borne Vibration and Noise Effects

Land Use Category	Ground-Borne Vibration Impact Levels (inch/sec rms)		Ground-Borne Noise Impact Levels (dB re 20 micro Pascals)	
	Frequent Events[1]	Infrequent Events[2]	Frequent Events[1]	Infrequent Events[2]
Concert Halls, TV Studios and Recording Studios	0.0018	0.0018	25 dBA	25 dBA
Auditoriums	0.0040	0.010	30 dBA	38 dBA
Theaters	0.0040	0.010	35 dBA	43 dBA

Notes:

[1] Frequent Events is defined as more than 70 vibration events per day. Most rapid transit projects fall into this category.

[2] Infrequent Events is defined as fewer than 70 vibration events per day. This category includes most commuter rail systems.

[3] This criterion limit is based on levels that are acceptable for most moderately sensitive equipment such as optical microscopes. Vibration sensitive manufacturing or research will require detailed evaluation to define acceptable vibration levels. Ensuring lower vibration levels in a building often requires special design of the HVAC systems and stiffened floors.

[4] Vibration-sensitive equipment is not sensitive to ground-borne noise.

[5] For historic buildings and ruins, the allowable upper limit for continuous vibration to structures is identified to be 0.056 inches/second rms. Transient conditions (single-event) would be limited to approximately twice the continuous acceptable value.

[6] For Categories 2 and 3 with occupied facilities, isolated events such as blasting are significant when peak particle velocity (PPV) exceeds one inch per second. Non-transportation vibration sources such as impact pile drivers or hydraulic breakers are significant when their PPV exceeds 0.1 inch per second. More specific criteria for structures and potential annoyance were developed by Caltrans (2004) and will be used to evaluate these continuous or transient sources in San Diego County

County Noise Ordinance Criteria

The County has adopted a quantitative noise ordinance to control excessive noise generated in the County (County of San Diego 2005). The noise ordinance limits are in terms of a one-hour average sound level. The allowable noise limits depend upon the County's zoning district and time of day as shown in Table 2. The project site is generally zoned S-88. The commercial area will be zoned C-36 and the multi-family will be zoned RM 22. The one-hour average sound level limits at a location between to zoning districts are the average of the two zones. Thus, the noise level limits between a C-36 and RM 22 zone are that the noise level not to exceed 57.5 dB between the hours of 7:00 a.m. to 10:00 p.m. and 52.5 dB between the hours of 10:00 p.m. and 7:00 a.m. Also, if the measured ambient noise level exceeds the applicable limit noted, the allowable one-hour average noise levels shall be the ambient noise level.

Construction noise is also governed by the County’s noise ordinance. Specifically, it shall be unlawful to operate any construction equipment to exceed an average sound level greater than 75 dB for an 8-hour period between the hours of 7:00 a.m. through 7:00 p.m., Monday through Saturday excluding legal holidays, when measured at the boundary line of the noise source or on any occupied property where the noise is being received.

Table 2
Sound Level Limits

Zone	Applicable Limit 1-Hour Average Sound Level (dB)		
	7 a.m. to 7 p.m.	7 p.m. to 10 p.m.	10 p.m. to 7 a.m.
R-S, RD, R-R, R-HM, A-70, A-72, S-80, S-81, S-87, S-90, S-92, R-V, and R-U use regulations with a density of less than 11 dwelling units per acre	50	50	45
R-RO, R-C, R-M, C-30, S-86, R-V, R-U and V5 use regulations with a density of 11 or more dwelling units per acre	55	55	50
S-94, V4 and all other commercial zones	60	60	55
V1	60	55	55
V2	60	55	50
V3	70	70	65
M-50, M-52, M-54	70	70	70
S-82, M56 and M-58	75	75	75
S-88 (See S88 footnote below)			

Notes:
If the measured ambient level exceeds the applicable limit noted, the allowable one-hour average sound level will be the ambient noise level. The ambient noise level will be measured when the alleged noise violation source is not operating.

The sound level limit at a location on a boundary between two zoning districts is the arithmetic mean of the respective limits for the two districts; provided however, that the one-hour average sound level limit applicable to extractive industries including but not limited to borrow pits and mines, will be 75 dB at the property line regardless of the zone where the extractive industry is actually located.

S88 zones are Specific Planning Areas which allow different uses. See County Noise Ordinance for specific information..

In addition to the general limitations on sound levels summarized in Table 2 and the limitations on construction equipment previously described, the following additional sound level limitations apply:

Except for emergency work or work on a public road project, no person shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in Table 3, when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period.

Table 3
Maximum Sound Level (Impulsive) Measured at Occupied Property

Occupied Property Use	Maximum Sound Level (dB)
Residential, village zoning, civic use	82
Agricultural, commercial, industrial use	85

Except for emergency work, no person working on a public road project shall produce or cause to be produced an impulsive noise that exceeds the maximum sound level shown in Table 4, when measured at the boundary line of the property where the noise source is located or on any occupied property where the noise is received, for 25 percent of the minutes in the measurement period, as described in the note in Table 4. The maximum sound level depends on the use being made of the occupied property.

Table 4
Maximum Sound Level (Impulsive) Measured at Occupied Property f or Public Road Projects

Occupied Property Use	Maximum Sound Level (dB)
Residential, village zoning, civic use	85
Agricultural, commercial, industrial use	90

Note:
The minimum measurement period for any measurements conducted under this section shall be one hour. During the measurement period a measurement shall be conducted every minute from a fixed location on an occupied property. The measurements shall measure the maximum sound level during each minute of the measurement period. If the sound level caused by construction equipment or the producer of the impulsive noise exceeds the maximum sound level for any portion of any minute, it will be deemed that the maximum sound level was exceeded during that minute.

U.S. Fish and Wildlife Service

The U.S. Fish and Wildlife Service typically require that construction noise not exceed a one-hour average noise level of 60 dB at biologically sensitive habitat areas.

City of San Marcos

The City of San Marcos has established noise guidelines in the Noise Element of the City's General Plan. These guidelines identify compatible exterior noise levels for various land use types. The maximum allowable noise exposure varies depending on the land use. For example, new single family residential, schools and churches are subject to a maximum acceptable exterior noise level of 60 dB CNEL. Multi-family residential is subject to an outdoor noise level of 65 dB CNEL.

The City of San Marcos has not adopted specific road widening/extension significance thresholds for existing noise sensitive land uses. For the purposes of this study, the noise impact is significant if the traffic noise level increase exceeds three dB CNEL and either elevates noise levels above the City's noise criteria limits or exceeds a three dB increase above an already noisy existing condition (i.e., 60 dB CNEL for single family residential, schools and churches, or 65

dB CNEL for multi-family residential). A noise level change of three dB is generally considered to be a just perceptible change in environmental noise.

4.0 EXISTING CONDITIONS

The primary existing noise source at the site is traffic along I-15 and Deer Springs Road. The existing traffic volume is approximately 124,000 average daily traffic (ADT) along I-15 (LLG 2009). Deer Springs Road has an existing traffic volume of approximately 16, 300 ADT adjacent to the site (LLG 2009).

4.1 Ambient Noise Monitoring

Noise measurements were conducted at the project site and nearby area to determine the existing noise level. The measurements were made using a calibrated Larson-Davis Laboratories Model 700 (S.N. 2132) integrating sound level meter and a Rion Model NA 27 Model (S.N. 701307). The sound level meters were equipped with ½-inch pre-polarized condenser microphones and pre-amplifiers. The sound level meters meet the current American National Standards Institute standard for a Type 1 precision sound level meter. The sound level meters were positioned at a height of approximately five-feet above the ground during the noise measurements.

Noise measurements were conducted at on November 10 and November 11, 2004; February 23, 2005; August 8, 2006; April 17 and April 18, 2007, November 7, 2007, and December 10, 2008. Three long-term (24-hour) noise measurements and seven short-term (20 minutes) noise measurements were made. The noise measurement locations are depicted as Sites 1 through 9 on Figure 4.

Site 1a was located at proposed Lot 1175 near Lawrence Welk Drive and approximately 650 feet to the center line of I-15. The view to I-15 in this area is generally blocked due to intervening topography between the site and I-15. This location was selected because it is the closest of the estate lots to I-15 and has the greatest angle of view to the highway (an approximate 85 degree angle of view of the highway). The measured noise level at Site 1a was 73 dB CNEL. The measured hourly average, maximum and minimum sound levels at Site 1a are depicted in Table 5A. The 24-hour noise measurement started at 7:00 a.m. on April 17, 2007.

Table 5A
Measured Hourly Average Sound Levels
(dB) (Site 1a)

Start Hour	Average Sound Level (dB)	Maximum Sound Level (dB)	Minimum Sound Level (dB)
0:00	61.5	72	45
1:00	60	69.5	40
2:00	59.5	68.5	39.5
3:00	61.5	70	45.5
4:00	66	75.5	52.5
5:00	71	75.5	63.5
6:00	72	79.5	66
7:00	71.5	76	68
8:00	70.5	76	64.5
9:00	68	75	63
10:00	68.5	75	58
11:00	66.5	81	58
12:00	67.5	75.5	59
13:00	66.5	73	59.5
14:00	66	73.5	59.5
15:00	67	80	60
16:00	68	74.5	63
17:00	68.5	78.5	64
18:00	66.5	73	61
19:00	66.5	72	58.5
20:00	65.5	71	59.5
21:00	65	71.5	58.5
22:00	64	74	52.5
23:00	62.5	72	50.5
CNEL	73		

At Site 1b a 24-hour noise measurement was conducted starting at 3:00 p.m. on November 10 and 11, 2004 at proposed Lot 1178 along Lawrence Welk Drive. The view to I-15 in this area is generally blocked due to intervening topography between the site and I-15 (approximate 20 degree angle of view of the highway). The measured noise level was 56 dB CNEL. The measured hourly average, maximum and minimum sound levels at Site 1b are depicted in Table 5B.

Table 5B
Measured Hourly Average Sound Levels
(dB) (Site 1b)

Start Hour	Average Sound Level (dB)	Maximum Sound Level (dB)	Minimum Sound Level (dB)
0:00	45	59	38
1:00	43	54	37
2:00	44	57	36
3:00	46	58	36
4:00	50	60	39
5:00	54	62	48
6:00	54	66	48
7:00	52	64	43
8:00	49	61	43
9:00	49	67	42
10:00	49	69	39
11:00	49	73	41
12:00	46	62	40
13:00	47	75	40
14:00	52	76	41
15:00	50	61	40
16:00	50	67	40
17:00	52	65	40
18:00	51	64	46
19:00	51	64	47
20:00	50	62	44
21:00	49	64	43
22:00	49	62	41
23:00	46	57	39
CNEL	56		

Site 2 was located near proposed Lot 150. This area has a slight view of the highway (approximately 10 degree angle of view of the highway). The measured average noise level at Site 2 was 52 dB and is shown in Table 6 with the concurrent traffic volumes along I-15.

Table 6
Measured Noise Levels and Traffic Volumes

Site	Description	Date/Time	L_{eq}[1]	Cars	MT[2]	HT[2]
2	Approximately 1,800 feet to center line of I-15	11/10/04 2:45 to 3:05 p.m.	52	2752	76	162
3	Approximately 1,150 feet from center line of I-15	11/10/04 3:45 to 4:05 p.m.	61	3318	51	100
4	Approximately 430 feet to center line of I-15	2/23/05 2:35 to 2:55 p.m.	70	2628	44	84
5	Sarver Lane near proposed Meadow Park Lane	2/23/05 3:30 to 3:50 p.m.	45	1	0	0
6	Approximately 45 feet to center line of Deer Springs Road	8/8/06 2:20 to 2:40 p.m.	70	278	5	4
7	Approximately 30 feet to center line of Deer Springs Road	8/8/06 1:45 to 2:05 p.m.	68	235	7	6
9	Approximately 65 feet to center line of Twin Oaks Valley Road	12/10/08 1:40 to 2:00 p.m.	66	272	5	5

Notes:
[1] Equivalent Continuous Sound Level (Time-Average Sound Level)
[2] Medium Trucks
[3] Heavy Trucks
Temperature 60 degrees, relative humidity 60%, 6 mph west wind, clear sky (11/10/04)
Temperature 69 degrees, relative humidity 40%, 3 mph, light and variable, cloudy sky (2/23/05)

Site 3 was located near proposed Lot 126. The location appears to have the greatest angle of view to I-15 for the single family homes proposed along the eastern edge of the site in this general area (an approximate 40 degree angle of view of the highway). The measured average noise level was 61 dB.

Site 4 was located at the eastern edge of proposed Neighborhood 1, Planning Area 3. This planning area is proposed for multi-family dwellings. The measurement location had an approximate 60 degree angle of view of I-15. The measured average noise level was 70 dB.

Site 5 was near the proposed Meadow Park Lane. The intervening topography shielded the site from the Deer Springs Road. The measured average noise level was 45 dB.

Site 6 was adjacent to Deer Springs Road and had an unobstructed view to the road. The measured average noise level was 70 dB.

Site 7 was adjacent to Deer Springs Road and had an unobstructed view to the road. The measured average noise level was 68 dB.

Site 8 was approximately 45 feet from the centerline of Deer Springs Road. The measured noise levels resulted in a CNEL of 74 dB. The measured hourly average, maximum and minimum sound levels beginning at midnight on November 7th, 2007 at Site 8 are depicted in Table 7. As shown in the table, the peak noise hour (in terms of the hourly average sound level) occurred between 6 a.m. and 7.am. The remaining daytime hours were generally one to three dB less than the peak noise hour.

Site 9 was adjacent to Twin Oaks Valley Road and had an unobstructed view to the road. The measured average noise level was 66 dB.

Table 7
Measured Hourly Average Sound Levels (dB) (Site 8)

Start Hour	Average Sound Level (dB)	Maximum Sound Level (dB)	Minimum Sound Level (dB)
0:00	61	83	33
1:00	59	79	30
2:00	58	78	30
3:00	62	79	29
4:00	65	80	29
5:00	70	84	35
6:00	73	89	35
7:00	72	82	45
8:00	72	82	37
9:00	71	88	38
10:00	71	86	36
11:00	70	85	35
12:00	70	84	37
13:00	71	89	36
14:00	72	86	41
15:00	73	84	45
16:00	70	82	49
17:00	67	81	49
18:00	70	79	42
19:00	70	80	41
20:00	69	87	38
21:00	68	81	40

Table 7
Measured Hourly Average Sound Levels
(dB) (Site 8)

Start Hour	Average Sound Level (dB)	Maximum Sound Level (dB)	Minimum Sound Level (dB)
22:00	65	84	36
23:00	64	82	36
CNEL	74		

4.2 Noise Modeling

The existing CNEL was calculated for Sites 1-4 based on the current traffic volume along the roads using Caltrans' SOUND32 noise model. The same traffic volume and vehicle composition ratios counted during the noise measurements were used to calibrate the model and verify the input used in the noise model. The truck mix used along I-15 are estimated based on truck mix counts conducted along I-15 just north of Highway 76 for the Pala Mesa Highlands Project and the truck mix noted during the noise measurements along Deer Springs Road. The modeled values ranged from 0 to 4 dB greater than the measured values. The greatest differences were at Sites 2 and 3. The modeled value was four dB higher than the measured value at Site 2 and three dB higher than the measured level at Site 3. These differences may be due to various variables including atmospheric attenuation as well as increasing complexity as the source and receiver distance increase. Some references assume that atmospheric attenuation is approximately 1 dB per 1,000 feet (Beranek & Ver 1992) which is about 0.5 dB/1,000 feet more than assumed by the noise model. Other factors could affect the noise measurements include wind speed/direction and assumed road surface conditions. The primary input for the SOUND32 noise model to calculate the CNEL includes:

Vehicle Speed: 65 MPH along I-15 (existing and future), 55 mph along Deer Springs Road (existing and future), 45 mph existing and 50 mph future along Twin Oaks Valley Road. These are the existing posted speed limits for the two-lane section and the existing adjacent improved four-lane section of Twin Oaks Valley Road.

Truck Mix: 2.6% medium trucks and 5.5% heavy trucks along I-15;

2% medium trucks and 2% heavy trucks along Deer Springs Road and Twin Oaks Valley Road

Existing ADT:	139,000 along I-15; 16,300 ADT along Deer Springs Road; 18,200 ADT to 20,200 ADT along Twin Oaks Valley Road.
Pavement Adj:	Plus 2 dB for I-15 (PCC pavement surface type).
CNEL:	14% of ADT is approximately equivalent to CNEL along I-15.
	10% of ADT is approximately equivalent to CNEL along Deer Springs Rd and Twin Oaks Valley Road.

The modeled existing CNEL is 73 dB at Site 1a, 57 dB at Site 1b and 60 dB at Site 2, 68 dB at Site 3, and 75 dB at Site 4. Noise modeling results are included in *Attachment 2*. Noise modeling was not performed for Site 5 because there is minimal traffic in the area. The CNEL is estimated to be approximately 47 dB at Site 5. The modeled CNEL at Sites 6 and 7 are 73 dB and 71 dB, respectively. The modeled existing noise levels are 74 dB CNEL and 69 dB CNEL at Sites 8 and at Site 9.

The County General Plan Noise Element states that the noise levels at any noise sensitive areas should not exceed 75 dB CNEL. The noise level currently exceeds 75 dB CNEL adjacent to I-15.

5.0 FUTURE CONDITIONS

Interstate 15, Merriam Mountains Parkway, Deer Springs Road and Meadow Park Lane would be the primary traffic noise sources affecting the site in the future. The future year 2030 traffic volume is projected to range up to approximately 248,000 ADT along I-15 (LLG 2008), up to 15,300 along Merriam Mountains Parkway, up to 55,300 ADT along Deer Springs Road, and up to 8,200 ADT along Meadow Park Lane adjacent to the site (LLG 2007 and 2009). In addition, commercial uses would be developed at the site.

The conceptual development of the project and the associated implementing actions are discussed in the following analysis of impacts for traffic noise, commercial uses, and construction activities.

5.1 On-Site Traffic Noise Impacts

As discussed in the following sections of this report, the future noise levels at the site would exceed 60 dB CNEL along I-15, Deer Springs Road, Merriam Mountains Parkway and Meadow Park Lane. Also, the future noise level would exceed 75 dB CNEL adjacent to I-15 and Deer Springs Road. The locations of the worst-case 60 and 75 dB CNEL noise contours are depicted

on Figure 5. The noise contours are worst-case scenario and do not include the noise attenuation associated with any intervening topography, buildings, or other structures that occur in the area. It should be noted that the noise modeling for on-site future conditions along Deer Springs Road include roadway improvements required by the proposed project, which includes widening the roadway to four lanes from Twin Oaks Valley Road to Interstate 15. The roadway design includes auxiliary lanes along the project frontage near Meadow Park Lane and Merriam Mountains Parkway. As seen in Section 8.0 the project includes the proposed reclassification of Deer Springs Road from a four-lane Major Road to a six-lane Prime Arterial roadway classification to accommodate planned land uses in the land use element of the General Plan. The ultimate roadway widening that may occur with the reclassification of the roadway to six lanes would be accommodated within the proposed footprint analyzed under the future conditions presented for onsite land uses.

The 2030 build-out ADT volumes along Deer Springs Road located adjacent to the proposed project ranges from 45,100 to 55,000 ADT (LLG 2008). The existing + project + cumulative ADT along Deer Springs Road adjacent to the proposed project range from 33,390 to 49,960 ADT (LLG 2008). Therefore, the projected ADT under the cumulative scenario is less than the 2030 build-out ADT for all roadway segments along Deer Springs Road. The noise analysis presented for proposed onsite land uses is based on the 2030 build-out ADT to determine the potential long-term noise impacts for onsite sensitive receptors because it provides the worst-case condition for proposed onsite land uses.

Neighborhood 1

Interstate 15 would generate a noise level of up to approximately 80 dB CNEL along the eastern edge of Neighborhood 1, Lot 4. Multi-family development is proposed for Lot 4. A site plan has not been prepared for the proposed multi-family development. Based on the proposed grading plan, outdoor noise sensitive areas (i.e., private areas including patios and balconies, and common use areas) would require noise mitigation measures, in the form of setbacks, to comply with the County's noise criteria. The distances between the top of the berm and the 75 dB and 60 dB CNEL first floor noise contours would range up to approximately 20 feet and 400 feet, respectively. The distances between the top of the berm and the 75 dB CNEL second floor and third floor noise contours would be approximately 35 and 80 feet, respectively. These distances assume the construction of an eight-foot high berm as shown on the TM for the project.

There would not be an unmitigated 60 dB CNEL noise contour at the second and third floor levels. The location of the future first floor 60 and 75 dB CNEL noise contours are depicted in Figure 6. Also, the locations of the 75 dB CNEL noise contour for 2nd and 3rd floor levels are depicted in Figure 7. The County General Plan Noise Element states that the noise level at any noise sensitive area shall not exceed 75 dB CNEL. The noise contours assume hard site propagation and the attenuation associated with intervening topography.

At Neighborhood 1, Lots 5, 6, and 9-12 the future noise level would exceed 60 dB CNEL due to traffic noise from Merriam Mountains Parkway. Site plans have not been prepared for the variable residential lots. However, outdoor noise sensitive areas located within approximately 320 feet of the center line of Merriam Mountains Parkway would require noise mitigation measures to comply with the County's noise criteria.

The distances to various future exterior noise contours are depicted in Table 8. The locations of the future 60 CNEL noise contours along Merriam Mountains Parkway in Neighborhood 1 are depicted in Figure 8A-8B. The noise contours reflect a "worst-case" potential and do not include the effects of shielding from buildings, terrain, or other barriers which would reduce noise levels. However, most of the outdoor noise sensitive areas of the lots would have limited views to the roads due to intervening topography between the future lots and the roads.

Table 8
Future CNEL Noise Contours and Traffic Data

Roadway	Lanes	Design	Volume	Vehicle Mix			Distances from Centerline to CNEL Contours (Feet)			
				Cars	MT	HT	75 dB	70 dB	65 dB	60dB
Merriam Mountains Parkway										
N-5 to Meadow Park Lane	2	40	5,300	98.5%	1.0%	0.5%	R/W[1]	R/W[1]	45	120
Meadow Park Lane to N-3	2	40	6,040	98.5%	1.0%	0.5%	R/W[1]	R/W[1]	50	140
N-3 to N-1	4	40	7,730	98.5%	1.0%	0.5%	R/W[1]	R/W[1]	60	180
N-1 to Retail	4	40	15,300	98.5%	1.0%	0.5%	R/W[1]	R/W[1]	120	320
Retail to Deer Springs Road	4	40	13,770	98.5%	1.0%	0.5%	R/W[1]	R/W[1]	110	290
Meadow Park Lane										
Merriam Mountain Pkwy. to N-2	2	30	8,000	98.5%	1.0%	0.5%	R/W[1]	R/W[1]	R/W[1]	95
N-2 to Deer Springs Rd.	4	30	8,200	98.5%	1.0%	0.5%	R/W[1]	R/W[1]	R/W[1]	100
Deer Springs Road										
Meadow Park Ln. to Merriam Mountain Pkwy.	4[1]	55	45,100	96%	2%	2%	90	255	660	1370

1 The four-lane classification includes auxiliary lanes along the proposed project frontage near Merriam Mountains Parkway and Meadow Park Lane.

Table 8
Future CNEL Noise Contours and Traffic Data

Roadway	Lanes	Design	Volume	Vehicle Mix			Distances from Centerline to CNEL Contours (Feet)			
				Cars	MT	HT	75 dB	70 dB	65 dB	60dB
Merriam Mountain Pkwy. to Mesa Rock	4[1]	55	49,300	96%	2%	2%	100	280	720	1500

Notes:
[1] Within right-of-way
MT = Medium Trucks
HT = Heavy Trucks
N-5 = Neighborhood 5

Neighborhood 2

At Neighborhood 2, the future traffic volume along Meadow Park Lane would range up to approximately 8,200 ADT (LLG 2007). The future noise level would exceed 60 dB CNEL within approximately 100 feet of the center line of Meadow Park Lane. Condominium (Figures 9A-9B) residential uses are proposed within Neighborhood 2. Site plans have not been prepared for these residential lots. However, outdoor noise sensitive areas located within approximately 100 feet of the center line of Meadow Park Lane would require noise mitigation measures to comply with the County's noise criteria. In addition, variable residential Lots 15-18 at Neighborhood 2 would be located near Deer Springs Road. The future noise level would range up to approximately 75 dB CNEL at the closest lots. The building pads would be above Deer Springs Road and would reduce the noise level to 75 dB CNEL or less just beyond the edge of the multi-family lots (i.e., within 10 feet of the edge of the pads adjacent to Deer Springs Road). Outdoor noise sensitive areas located within approximately 1,500 feet of Deer Springs Road could require noise mitigation measures.

Neighborhoods 3, 4, and 5

Single family homes are proposed within Neighborhoods 3, 4 and 5. Merriam Mountains Parkway and I-15 would generate noise levels in excess of 60 dB CNEL along portions of these neighborhood areas. The future traffic volume would range up to approximately 7,730 ADT at the single family lots adjacent to Merriam Mountains Parkway (LLG 2007). The future noise level along Merriam Mountains Parkway would be approximately 60 dB CNEL at a distance of up to 180 feet from the center line of the road. The majority of the single family lots adjacent to Merriam Mountains Parkway would be located within the 60 dB CNEL noise contour (Figures 10A-10B). Therefore, if not mitigated, the traffic noise impact at the lots adjacent to Merriam Mountains Parkway would be significant.

Lots 124-127 and 129-132 in Neighborhood 3, Planning Area 1 would be adjacent to I-15. The lots would be partially shielded by intervening topography from traffic noise along I-15. However, the future year 2030 unmitigated noise level would exceed 60 dB CNEL at these lots. Therefore, if not mitigated, the traffic noise impact at these lots adjacent would be significant.

The remaining lots in Neighborhoods 3, 4, and 5 would be exposed to future noise levels of 60 dB CNEL or less.

Estate Lots

Estate Lots 1175-1184 would be near I-15. All the homes on these lots shall be single story. All the lots would be partially screened from traffic noise along I-15 by the intervening topography. However, the noise level would exceed 60 dB CNEL at Lots 1175-1177. Therefore, if not mitigated, the traffic noise impact at these lots would be significant. The net lot areas of Lots 1175 through 1177 are 8.27-acres, 5.01-acres, and 5.00-acres, respectively. Thus, the required usable outdoor area at the lots range from 0.50 acre to 0.827 acres. The approximate location of the 75 dB CNEL noise contour for the first-floor level is depicted in Figure 11. The noise contour includes the attenuation associated with intervening topography based on field sound tests in the area.

5.2 Long-Term Off-Site Traffic Noise Impact

Existing with Project: The project would generate traffic along several existing roads in the area including Twin Oaks Valley Road, Deer Springs Road, Buena Creek Road, Monte Vista Road and I-15. With the exceptions of Mesa Rock Road between Deer Springs Road and North Centre City Parkway; and Buena Creek Road between Monte Vista Road and Twin Oaks Valley Road the additional project-generated traffic would increase the noise along the adjacent roads by three dB CNEL or less. Therefore, the additional traffic volume along most roads would not substantially increase the existing noise level in the project vicinity and the traffic noise level increase is considered less than significant. The existing plus project noise level increase associated with the additional traffic volume is depicted in Table 9.

The noise level associated with traffic along Mesa Rock Road would increase by approximately six dB CNEL between Deer Springs Road and North Centre City Parkway. However, I-15 is directly to the east of Mesa Rock Road and is the primary noise source in the area with an existing traffic volume well more than 100,000 ADT. The actual noise level increase at existing residences would be less than three dB CNEL because the traffic along I-15 will continue to be the primary noise source.

Near Term Cumulative with Project: The anticipated near-term cumulative with project traffic volumes would result in a significant noise impact along Buena Creek Road between Monte Vista Drive and Twin Oaks Valley Road. The project would contribute 4,710 ADT along Buena Creek Road, between Monte Vista Drive and Twin Oaks Valley Road. The increase associated with near-term cumulative traffic would be approximately four dB CNEL along this road segment as shown in Table 9.

This 4 dB CNEL noise level increase would exceed County significance threshold criteria, which identifies a significant noise impact would occur if the noise levels would increase over three dB from existing conditions. The project's net contribution to the near-term cumulative noise level increase would be approximately 1 dB CNEL. Therefore, the project's portion of the cumulative noise impact is cumulatively considerable. The existing 60 dB CNEL noise contour extends approximately 210 feet from the center line of Buena Creek Road. The existing-plus-project 60 dB CNEL noise contour would extend approximately 270 feet from the center line of Buena Creek Road. The existing plus project plus cumulative projects 60 dB CNEL noise contour would extend approximately 360 feet from the centerline of Buena Creek Road. The future noise levels would range between approximately 61 and 70 dB CNEL at the noise sensitive areas of the residences located in this area. It should be noted these noise levels and distances assume that there is no shielding from intervening walls, topography, buildings or other structures that would reduce the noise levels. Per a worst-case, scenario approximately 30 additional homes would be exposed to noise levels greater than 60 dB CNEL under existing plus project plus cumulative projects conditions. However, many of these homes are currently located behind intervening houses and topography that would shield the homes to noise levels 60 dB CNEL or less.

Table 9
Off-Site Traffic Noise Level Increase

Street (Segment)	Exit. ADT	Existing w/ Project ADT	CNEL Increase[1] (dB)	Near Term Cumulative w/o Project ADT	Near Term Cumulative w/ Project ADT	CNEL Increase[2] (dB)	CNEL Increase[3] (dB)	Percent[4] (dB)
Deer Springs Road								
Twin Oaks Valley Rd. to Meadow Park Ln.	18,400	28,410	2	23,350	33,360	3	2	60
Meadow Park Ln. to Merriam Mt. Pkwy.	16,300	27,730	2	21,960	33,390	3	2	58
Merriam Mt. Pkwy. to Mesa Rock Rd.	16,300	35,440	3	21,830	40,970	4	3	68
Mesa Rock Rd. to I-15 SB Ramps	22,300	44,430	3	27,830	49,960	4	3	73
I-15 SB Ramps to I-15 NB Ramps	14,900	29,000	3	19,130	33,230	3	2	69

Table 9
Off-Site Traffic Noise Level Increase

Street (Segment)	Exit. ADT	Existing w/ Project ADT	CNEL Increase[1] (dB)	Near Term Cumulative w/o Project ADT	Near Term Cumulative w/ Project ADT	CNEL Increase[2] (dB)	CNEL Increase[3] (dB)	Percent[4] (dB)
I-15 NB Ramps to Champagne	11,800	18,400	2	17,890	24,490	3	1	43
Mountain Meadow Road								
East of Champagne	7,200	9,820	1	13,030	15,650	3	1	24
Twin Oaks Valley Road								
West of Deer Springs Rd.	2,300	2,660	1	2,990	3,550	2	<1	25
Deer Springs Rd. to Buena Creek Rd.	18,200	25,930	1	25,230	30,960	2	1	54
Buena Creek Rd. to Cassou Rd.	18,200	22,540	1	24,250	28,590	2	1	36
Cassou Rd. to La Cienega Rd.	19,350	22,880	1	25,420	28,950	2	1	32
La Cienega Rd. to Windy Wy.	24,500	28,030	1	33,080	36,610	2	<1	25
Windy Wy. to Borden Rd.	24,500	28,030	1	32,770	36,300	2	<1	26
Borden Rd. to Richmar Ave.	30,000	32,570	<1	44,100	46,670	2	<1	13
Richmar Ave. to San Marcos Blvd.	28,300	30,870	<1	43,090	45,660	2	<1	12
San Marcos Blvd. to SR 78 WB Ramps	41,500	42,430	<1	60,310	70,240	2	<1	3
Buena Creek Road								
West of Monte Vista Dr.	10,900	13,470	1	16,430	19,000	2	1	26
Monte Vista Dr. to Twin Oaks Valley Rd.	10,600	15,310	2	17,840	23,650	4	1	28
Monte Vista Drive								
Foothill Dr. to Buena Creek Rd.	8,700	10,600	1	10,900	13,600	2	1	34
Champagne Blvd.								
Gopher Cny to Lawrence Welk Dr.	5,500	6,590	1	7,480	9,070	3	1	26
Lawrence Welk Dr. to Mt. Meadow Rd.	6,600	8,030	1	9,080	10,510	2	1	31
Mesa Rock Road								
Deer Springs Rd. to N. Centre City Pkwy.	900	3,730	6	1,030	3,860	6	6	91

Notes:
[1] Existing vs. existing plus project noise increase.
[2] Existing vs. near term cumulative with project.
[3] Project contribution to near-term cumulative.
[4] Project decibel percentage contribution to near-term cumulative noise level increase.
Sound levels are rounded to the nearest whole dB CNEL.
Bold = Exceeds Significance Threshold

The near-term cumulative with project traffic volumes along Mesa Rock Road between Deer Springs Road and North Centre City Parkway would result in a noise level increase of 6 dB CNEL associated with this road. However, as previously discussed, the actual noise level increase would be less than three dB CNEL because the traffic along I-15 will continue to be the primary noise source.

5.2.1 Deer Springs Road and Twin Oaks Valley Road Widening

The project proposes to widen and realign Deer Springs Road and Twin Oaks Valley Road from approximately 1,000 feet south of Cassou Road to the I-15 interchange. The roads would be widened from two lanes to four lanes. Widening and realigning would result in some traffic lanes located closer to existing homes. Noise modeling was completed to determine the noise level increase associated with the Deer Springs Road and Twin Oaks Valley Road widening and realignment for sensitive receptors located adjacent to these roads. The noise modeling evaluates potential impacts based on the Deer Springs Road/Twin Oaks Valley four-lane road widening design plans which include the proposed centerline alignment modification, lane widening, road elevation changes, topography changes, as well as the anticipated existing-plus-project-plus cumulative traffic volumes (LLG 2009). These traffic volumes range from 33,360 to 49,960 ADT along Deer Springs Road and 28,590 ADT to 30,960 ADT along Twin Oaks Valley Road.

Deer Springs Road: Based on the results of the noise modeling, the traffic noise level along Deer Springs Road with the existing plus project plus cumulative scenario would result in a noise level increase of four to five dB CNEL compared to the existing noise level at five single family residences, and at several mobile homes within the Deer Springs Mobile Home park adjacent to Deer Springs Road The calculated existing and future noise levels along Deer Springs Road and Twin Oaks Valley Road are depicted in Table 10. This noise level increase represents a significant cumulative impact and the project's contribution of one dB CNEL or more to noise conditions represents a cumulatively considerable contribution to five existing residences and at several Deer Springs Mobile Home Park residents. Deer Springs Mobile Home Park is represented by Receptors 1 to 4 as shown on Figure 12A). The five single family residences are represented by Receptors 5, 14, 17, 18 and 19 as shown on Figures 12B through 12D).

The noise level increase at the outdoor use areas, group or private usable open space areas of the remaining residences and sensitive receptors, would be three dB CNEL or less. It should be noted that Receptor 12 is partially shielded from intervening topography and this site is not considered a noise sensitive receptor outdoor use area. Also, at Receptor 12, as well as Receptor 16 and 20 the future Deer Springs Road alignment would result in projected traffic being placed farther away from the receptors than currently occurs with the existing alignment. Thus, the

"equivalent lane distance" between these receptors and Deer Springs Road would increase in the future as compared to the existing conditions. The equivalent lane distance is the distance to a specific receiver from an imaginary single lane which acoustically represents a multi-lane highway or group of lanes, such as directional lanes.

It should be noted that the only receptor which would result in a direct significant noise impact associated with the Deer Springs Road improvements and the existing plus project traffic volumes would be Receptor 18. The existing plus project noise level increase associated at Receptor 18 is calculated to increase by 4 dB CNEL. The project's noise contribution would be considered a direct impact. A near-term cumulative with project noise impact was also previously identified at this location.

Twin Oaks Valley Road: Improvements that would be completed along Twin Oaks Valley Road would be completed within the City of San Marcos. The City of San Marcos has established noise guidelines in the Noise Element of the City's General Plan. These guidelines identify compatible exterior noise levels for various land use types. The maximum allowable noise exposure varies depending on the land use. For example, new single family residential, schools and churches are subject to a maximum acceptable exterior noise level of 60 dB CNEL. Multi-family residential is subject to an outdoor noise level of 65 dB CNEL.

The City of San Marcos has not adopted specific road widening/extension significance thresholds for existing noise sensitive land uses. For the purposes of this study, the noise impact is significant if the traffic noise level increase exceeds three dB CNEL and either elevates noise levels above the City's noise criteria limits or exceeds a three dB increase above an already noisy existing condition (i.e., 60 dB CNEL for single family residential, schools and churches, or 65 dB CNEL for multi-family residential). A noise level change of three dB is generally considered to be a just perceptible change in environmental noise.

The noise-sensitive land uses along Twin Oaks Valley Road include single family residences, a school, and a church. The existing noise level at the noise-sensitive land uses adjacent to Twin Oaks Valley Road generally range from 63 to 68 dB CNEL. These noise levels exceed the City's 60 dB CNEL noise guideline. The existing plus project plus cumulative project noise level would result in a noise level increase of approximately three dB CNEL as compared to the existing noise level. The future noise level would continue to exceed a CNEL of 60 dB at the adjacent noise sensitive land uses. However, the noise level increase associated with the project would be less than significant.

The 75 dB CNEL noise contour along the proposed Deer Springs Road alignment due to the existing plus project plus cumulative projects traffic volume is shown in Figures 13A-13C. As shown in the figure the 75 dB CNEL noise contour is located nearly along the proposed right-of-way. The County of San Diego's Zoning requires minimum building setback distances from the centerlines of roads. As a four-lane Major Road, the minimum building setback distance within zones (R-R, A-70, A-72, S-80, S87, S-90 and S-92 with a lot size designator or 1 acre of larger) would be 79 feet from the center line of the Deer Springs Road. The traffic 75 dB CNEL noise contour distance would be less than the minimum required building setback distance for both a four-lane and road. Therefore, the traffic noise associated with the project would not result in constraints to development of noise-sensitive off-site property due to the location of the 75 dB CNEL noise contour.

Table 10
Existing and Future CNEL at Various Noise Receptor Locations Along Deer Springs Road and Twin Oaks Valley Road

Receptor	Existing	Existing + Project[1]	Existing + Cumulative[2]	Existing + Project + Cumulative[3]	Noise Level Increase[4]
1	63	66	64	67	4
2	64	67	66	68	4
3	66	69	68	70	4
4	67	70	68	71	4
5	64	67	65	68	4
6	66	68	67	69	3
7	65	67	66	68	3
8	60	60	61	61	1
9	59	60	61	61	2
10	62	62	63	63	1
11	61	62	63	63	2
12	68	69	69	70	2
13	62	64	63	65	3
14	69	72	70	73	4
15	65	65	66	66	1
16	71	71	72	72	1
17	62	65	64	66	4
18	62	66	63	67	5
19	63	66	64	67	4
20	66	68	67	69	3

Table 10
Existing and Future CNEL at Various Noise Receptor Locations Along Deer Springs Road and Twin Oaks Valley Road

Receptor	Existing	Existing + Project[1]	Existing + Cumulative[2]	Existing + Project + Cumulative[3]	Noise Level Increase[4]
21	65	67	67	68	3
22	64	66	66	67	3
23	65	67	67	68	3
24	68	70	70	71	3
25	63	65	64	66	3
26	67	69	68	70	3
27	66	68	67	69	3
28	68	70	69	71	3
29	63	65	64	66	3
30	66	68	67	69	3
31	65	67	66	68	3

Notes:
1 Existing Plus Project Traffic Volumes; 4-Lane Deer Springs Road
2 Existing Plus Cumulative Project Traffic Volumes; Existing Deer Springs Road
3 Existing Plus Project Plus Cumulative Projects Traffic Volumes; 4-Lane Deer Springs Road
4 Existing vs. Existing Plus Project Plus Cumulative Projects
Bold = Exceeds Significance Threshold
N/A = Not Applicable
Sound levels rounded to the nearest whole dB CNEL
The existing + project, existing + project + cumulative noise levels incorporate the realignment and widening of Deer Springs Road

5.2.2 Meadow Park Lane

The project would construct Meadow Park Lane which would mostly occur onsite except for a short segment of the road located between the southern project limits and the planned Neighborhood 2, Planning Area 3. Meadow Park Lane would be constructed approximately 150 feet or more from the closest existing homes located west of the planned road. At this distance, the future noise level at buildout of the project would be approximately 57 dB CNEL or less. This noise level is below the County of San Diego's guideline of 60 dB CNEL and would not substantially exceed the existing noise level.

5.3 Commercial Uses

Commercial areas are proposed along the east side of Merriam Mountains Parkway near the intersection with Deer Springs Road (Neighborhood 1). Onsite residential development at Neighborhood 1 is proposed adjacent to the commercial area at Neighborhood 1. The

commercial area will be zoned C-36 and the multi-family will be zoned RM 22. The one-hour average sound level limit at a location between to zoning districts is the average of the two zones. Thus, the noise level limits between a C-36 and RM 22 zone are that the noise level not exceed 57.5 dB between the hours of 7:00 a.m. to 10:00 p.m. and 52.5 dB between the hours of 10:00 p.m. and 7:00 a.m.

Sources of commercial noise typically include activities at loading/unloading docks and parking lots; heating/ventilation and air conditioning equipment (HVAC); maintenance activities; and additional truck traffic along adjacent roads.

Noise levels associated with the commercial activities would vary depending on the number of delivery trucks, loading dock areas and customer traffic generated by the commercial site. Similarly, HVAC equipment noise would vary depending on the number and types of equipment selected. Typical roof-top HVAC packaged units generate noise levels of approximately 70 dB at ten feet from the source. The commercial sites would have to be designed so that noise levels would comply with the County's noise ordinance and not result in significant noise impacts at adjacent proposed residential property boundaries. Commercial uses such as floral shops, mail box stores, gift stores and deli restaurants can generally meet the sound level limits next to multi-family residential zones (RM 22).

Commercial activities involving noise sensitive uses such as day care centers and private schools may be precluded at the commercial areas. Commercial areas are only occupied a portion of the day, therefore, noise sensitive areas at the commercial areas should not be exposed to noise levels greater than a peak hour one-average sound level of 60 dB. The interior noise level, due to outside noise, should not exceed one-hour average sound level 50 dB for rooms that are usually occupied only a part of the day (schools, libraries, or similar).

A fire station is proposed within the commercial area of the proposed project (Neighborhood 1, Planning Area 1). Typically, noise associated with a fire station results from the intermittent use of sirens, standby emergency generators, testing auxiliary fire truck equipment, and outdoor mechanical equipment (e.g., air conditioning units, exhaust fans). The fire station location within Neighborhood 1, Planning Area 1 has not been sited at this time. In the event that the fire station is proposed adjacent to multifamily uses, noise levels associated with outdoor equipment could exceed the County's noise ordinance requirements, depending in part on the type and location of the equipment. Thus, significant noise impacts could result at adjacent properties. In addition, the interior noise level within the habitable rooms of the fire station should not exceed 45 dB CNEL.

5.4 Construction Noise and Vibration

Construction Equipment: The noise levels generated by construction equipment would vary greatly depending upon factors such as the type and specific model of the equipment, the operation being performed and the condition of the equipment. The average sound level of the construction activity also depends upon the amount of time that the equipment operates and the intensity of the construction during the time period. Construction activities would occur during the County's allowable hours of operation.

Construction would involve several phases including clearing and grubbing, grading, foundation construction and finish construction. The maximum noise level ranges for various pieces of construction equipment at a distance of 50 feet are depicted in Figure 14. Note that these are maximum noise levels, not the average sound level generally used in this assessment. The average sound level at construction sites is typically less than the maximum noise level because the equipment operates in alternating cycles of full power and low power. Also, the equipment rotates in various directions (i.e., noisiest side of the equipment to quieter sides of the equipment), and moves around the construction site, especially during clearing, grubbing and grading activities. Thus, the average noise levels produced are less than the maximum level.

Typically, the greatest one-hour average noise level occurs during clearing, grubbing and grading activities. Construction equipment used during this construction phase typically includes scrapers, dozers, compactors and water trucks. We have conducted noise measurements utilizing similar graders, bulldozers, loaders, water trucks, etc. Based on those noise measurements, the one-hour average noise level during ground clearing and grading activities ranges from approximately 75 to 80 dB at 50 feet from the closest construction work area. Equipment operated during the noise measurements typically included six or more scrapers and dozers, and two or three water trucks, backhoes, loaders, blades and pickup trucks.

Construction noise in a well defined area typically attenuates at approximately six dB per doubling of distance (Beranek and Ver 1992). The closest existing homes to the construction activities would be located approximately 500 feet west of the estate lots, 100 feet south of the proposed intersection of Deer Springs Road and Merriam Mountains Parkway, and adjacent to Meadow Park Lane. The one-hour average noise level would be approximately 74 dB or less at the closest homes west of the estate lots and south of the proposed intersection of Deer Springs Road and Merriam Mountains Parkway during grading of the site. This assumes a direct line-of-sight from the receiver to the construction area. This noise level would comply with the County's noise criteria at the homes. Construction noise would be less at other areas and during the later phases, such as foundation construction and framing.

A portion of Meadow Park Lane would be constructed off site. The primary noise sources would most likely include a dozer, grader, loader, dump trucks, paver, heavy trucks, crew and delivery trucks, water trucks, and roller compactors.

Approximately six existing homes would be located adjacent to the proposed Meadow Park Lane alignment. The construction activities would generally be 150 or more feet from the closest homes. With the exception of the drilling and blasting activities discussed, the average noise level associated with the construction activities would be approximately 70 dB or less. These construction noise levels would result in a less than significant noise impact.

The significance criteria previously identified in Table 1 for ground-borne vibration and noise impacts are primarily based on studies associated with rail rapid transit systems (FTA 2006). Ground-borne vibration and noise information related to construction activities has been collected by the Caltrans (Caltrans 2004). Information from Caltrans indicates that continuous vibrations with a peak particle velocity of approximately 0.1 inches/second begin to annoy people. However, vibration is very subjective and some people may be annoyed at continuous vibration levels near the level of perception (or approximately a peak particle velocity of .01 inches/second). Construction activities are not anticipated to result in continuous vibration levels that typically annoy people.

Construction staging areas would be located within the project site. The maintenance of construction equipment is anticipated to occur as follows: Staging areas during construction would be located within the project limits at the maximum distance from existing sensitive receptors to the extent feasible. Construction equipment repairs would occur on site such as re-fueling, air filter replacement, etc. However any major repairs would be done at an offsite location. All equipment repairs would be completed within the staging areas and would be conducted during the noise ordinance's allowable hours and days of operation for construction.

Blasting Noise and Vibration: Blasting would be required at many areas at the site. Figure 15 illustrates the potential areas of the site where blasting could be necessary as part of earthwork activities. Blasting would occur between 7:00 a.m. and 5:00 p.m. Construction blasting generates a maximum noise level of approximately 94 dB at a distance of 50 feet (BBN 1989). This source noise level is used in this analysis because it provides a reasonable estimate of the construction blasting noise level. However, the noise level would vary depending on various factors, as more fully described. The blast is generally perceived as a dull thud, rather than as a loud explosion.

U.S. Bureau of Mines: The United States Bureau of Mines (USBM) has provided an impact guide in the area of structural and human response to vibration (1980 USBM RI 8507, "Structure Response and Damage Produced by Ground Vibration from Surface Mine Blasting"). The criteria are well accepted for all types of ground vibration and are based on the peak particle velocity of the receiving structure. The criteria are shown in Figure 16. The potential for damage to residential structures is greater with low-frequency blast vibration (below 40 Hertz (Hz)) than with high frequency blast vibration (40 Hz and above). For low-frequency blast vibration, a limit of 0.75 inches per second (in/sec) for modern drywall construction and 0.50 in/sec for older plaster-on-lath construction was proposed. For frequencies above 40 Hz, a limit of 2.0 in/sec for all types of construction was proposed.

The USBM also published a document regarding recommendations for maximum safe air overpressure levels for blasting (1980 USBM RI 8485, "Structure Response and Damage Produced by Airblast From Surface Mining," The document recommends a maximum safe air overpressure of 134 dB (linear) for residential structures. The first occurrence of airblast damage is usually the breakage of poorly mounted windows at approximately 152 dB (linear) (Jones and Stokes 2004). The response and annoyance problem from airblast is probably caused primarily by wall and window rattling and the resulting secondary noises. Although these effects will not entirely be precluded by the recommended levels, the recommended levels are considered low enough to preclude damage to residential structures, but may not address the annoyance of individuals.

County of San Diego Blasting Permit: To conduct blasting, a blasting permit must be obtained from the County of San Diego prior to blasting (Division 5 of Title 3 of the San Diego County Code of Regulatory Ordinances). The permit is in accordance with the California Health and Safety Code requirements. The permit ensures that blasting is conducted in a safe manner. As part of the permit conditions pre-blast notifications, pre-blast structure survey inspections for structures within 300 feet of the blast site, monitoring and post-blast inspections are necessary.

Human Response to Blasting: Human response to blast vibration and air overpressures from blasting is difficult to quantify. Ground vibration and air overpressures can be experienced at levels that are well below those required to produce any damage to structures. The duration of the event and frequency has an effect on human response. Events are of short duration, one to two seconds for millisecond-delayed blasts. Typically, the longer the event and the higher the frequency, the more adverse the effect on human response. Factors such as frequency of occurrence, fright or "startle factor level" of personal activity at the time of the event, health of the individual, time of day, orientation of the individual (standing up or lying down), the perceived importance of the blasting operation, and other political and economic considerations also affect human response.

The average human response to vibration and air overpressures that may be anticipated when the person is at rest, situated in a quiet surrounding (Jones & Stokes 2004). There is not a direct connection between vibration levels and air overpressure levels, except as the particular levels apply to human response. In blasting, an increase in vibration can at times be accompanied by a decrease in air overpressures, and vice versa.

Blasting could potentially occur in several hard rock areas. The sudden and intense airborne noise potential created by a blast could create adverse reactions for nearby sensitive receptors. Additionally, blasting could create local ground-borne vibrations. The character of the blast and ground vibrations would be dependent on such factors as type of soil/rock, type of explosive, amount of explosive used, depth of explosion and meteorological conditions. Drill-and-blast methods would generally consist of the following steps: (1) drilling a pattern of holes in a rock face and loading the holes with explosives, (2) blasting the round and ventilating the blasting gasses, (3) mucking the blasted rock, and (4) installing initial ground support as needed.

Ground vibration is controlled by limiting the amount of energy released into the rock at a time. The energy is distributed through the rock to be blasted in the form of holes drilled into the rock. The holes are detonated in a progressive sequence that resembles slices of bread being removed from a loaf. One slice is removed to make room for the next slice, and so on. By controlling the number of holes detonated at one time, the amount of energy released can be controlled as well. This energy decays with distance from the blast.

By knowing the distance to the closest structure to protect, the amount of energy that can be released into the ground at any one delay period can be calculated without causing damage due to ground vibration.

These vibrations and accompanying noise can cause annoyance to the people living and working near a blasting operation. Careful calculations and placement of the explosives can control these adverse effects of blasting. This is a responsibility of the blaster.

The amount of explosives a blaster can use is based in part upon the distance to the nearest structure. The greater the distance, the more pounds per delay that can be used for the blast. However, that doesn't mean the blaster will use all of the explosives allowed because the goal is to use only that amount necessary to accomplish the job. Some small blasting operations use only a few pounds of explosives and can be used to blast in close proximity to structures without causing damage.

There are approximately 20 homes, the Deer Springs Mobile Home Park and the Golden Door located within 600 feet of the potential blasting areas. There is insufficient information available

at this time to perform specific calculations of the ground-borne vibration from the blasting, and these calculations are not required to be performed at this time. However, one of the most commonly accepted formulas for blast vibration prediction in use is shown and is based on data gathered from a large number of blasts in various geological settings (Transportation and Construction Induced Vibration Guidance Manual, Jones & Stokes 2004).

The basic formula for predicting blast vibration is:

PPV = K (Ds) –1.6

Where:

PPV = peak particle velocity (inches per second)

Ds = square-root scaled distance (distance to receiver in feet divided by square root of charge weight in pounds)

K = A variable subject to many factors, upper and lower bounds are 242 and 24, respectively.

Most conventional blasts will fall between these bounds. Similarly, peak air overpressure can be calculated using the equation:

Peak air overpressure (in pounds per square inch [psi]) = K (Ds) –1.2

K = Combined intercepts at a Ds of 1 of 2.5 and 0.78, respectively for confined charges.

The resulting curves from these equations, representing the upper and lower bounds for typical down-hole blasting are shown in Figures 17 and 18. As illustrated in the figures, by simply varying the charge weight, the resulting vibration or air overpressure level can be significantly decreased or increased. For example, for a receiver at 150 feet, and with a charge weight of 50 pounds, the peak particle velocity would range between approximately 0.18 to 1.82 inches per second depending on such variables as confinement of energy, elastic moduli of the rock, spatial distribution of the energy sources, time of energy release or timing scatter, and coupling of the energy sources. For a receiver at 150 feet, and with a charge weight of 10 pounds, the peak particle velocity would range between approximately 0.05 to 0.50 inches per second. Using the same example, the peak air overpressure would range between approximately 123 and 134 dB (linear, not A-weighted) with a charge weight of 10 pounds. Thus, using a charge weight of 10 pounds the vibration from the blast would typically be perceived as distinctly to strongly

perceptible, and the air blast would be perceived as mildly to distinctly unpleasant for a receiver at 150 feet. With this charge weight the blast would not be anticipated to exceed the USBM limits for safe blasting. When more site specific information is available, the blaster would design the blasts to not exceed the guidelines for blasting as identified in Figure 16 and to comply with the conditions of the County of San Diego's blasting permit.

The construction blasting vibration and noise levels would most likely be noticeable by receptors at nearby locations, but not a significant source of impact due to the infrequent nature of blasting operations, conformance with the County of San Diego's standard blasting permit requirements and compliance with USBM Report of Investigation (RI) 8507 and RI 8485 criteria for safe levels of blasting.

Prior to the commencement of any blasting activities a blasting permit shall be obtained from the Sheriff or the Chief Officer of the fire department serving the jurisdiction, pursuant to Article 77 of the Uniform Fire Code. Blasting shall be conducted in accordance with the County of San Diego's blasting permit requirements and conditions, as well as the USBM criteria for safe levels of blasting.

Regarding potential property damage, structures in close proximity to the blasting area would be surveyed prior to any blasting and after the blasting. The Contractor would verify the minimum distance that a qualified blaster considers acceptable. If it is determined that blasting cannot be conducted in an area, the rock would be removed by alternative methods such as the use of excavation equipment or dozers.

It should be noted that the San Diego County Water Authority Administrative Code (SDCWA) Article 7, Section 7.00.040 (h) prohibits blasting within 400 feet of an Authority facility, except as specifically permitted by the SDCWA and subject to all applicable State and local and state laws. The project would comply with this SDCWA requirement.

Drilling would be necessary to bore holes for the blasting materials. Rock drills generate air-borne noise levels of approximately 80 to 98 dB at a distance of 50 feet. Typically, drilling holes for a blasting pattern can last from several hours to several days. The period of time to drill per blast depends on several factors including the number of holes, the depth of the holes and the effort required to drill through the rock. No more than one to two blasts would occur in any one area per day because of the time required to drill the holes as well as insert and connect the blasting materials. The closest existing homes to potential drilling and blasting areas would be located adjacent to proposed Meadow Park Lane. The closest home would be located approximately 150 feet away (Figure 19). Smaller blasting charges would be used in areas that are closer to existing homes. Assuming drilling and blasting activities are conducted adjacent to

the closest home, that the loudest drill operates continuously for 8 hours, and two blasts are conducted, the 8-hour average noise level would be approximately 88 dB at the closest home. This noise level would exceed the County's noise ordinance criteria by 13 dB and result in a significant noise impact if not mitigated. The primary noise source would be the drilling and not the blast due to short duration of the blast compared to the ongoing drilling activity. The existing residences in this area would be subject to drilling and blasting noise for approximately six months. The drilling and blasting activity would be intermittent. After each blast, typically it would be several days to a couple of weeks before the next drilling and blasting sequence so that the material can be removed from the excavation area. Existing homes would also be located at the Deer Springs Mobile Home park, approximately 300 feet or more from these activities. Thus, these residents would be subject to drilling and blasting noise to a lesser degree than described during the construction of the project site. Also, please see Construction Noise Associated with Off-Site Road Improvements within this section regarding Deer Springs Road construction activities.

The blast would be an impulsive noise event resulting in a maximum noise level of approximately 84 dB at the closest residence. As previously noted, no more than two blasts would occur in a day. The noise from the blast would comply with the County's impulsive noise standard because the number of blasts would not exceed 25% of the minutes in the 1-hour measurement period.

Portable Rock Crushing/Processing Facility: A portable rock crushing/processing facility would be used at the site during these construction activities. The rock crushing operation would begin with a front loader picking up material and dumping the material into a primary crusher. The material would be then crushed, screened and stacked in product piles. The material would be stockpiled adjacent to the rock crushing equipment. All material will be used onsite. Electric power would most likely be provided by a diesel engine generator. The primary crusher would generate impulsive noise events. Preliminarily, two rock crushing locations have been identified at the site and would be located within Neighborhoods 3 and 5 as depicted in Figure 20. The closest existing home would be located more than approximately 1,800 feet from to the proposed rock crushing areas. At this distance the noise level (both 8-hour average and impulsive noise) associated with the rock crushing activities would not be significant. In addition, there would be intervening topography that would shield adjacent homes from the rock crushing facilities.

Construction Noise Impacts at Future On-Site Residences: Construction would occur in five phases (Phases A-E) as previously depicted in Figure 15. The project would be phased so that the future closest occupied homes would be located approximately 600 feet from a rock crushing facility. Based on noise measurements that have been conducted for portable rock crushing

operations, the rock crushing activity would generate a one-hour average noise level of approximately 80 dB at a distance of 100 feet from the primary crusher. Maximum noise levels associated with the primary crusher could reach approximately 88 dB at 100 feet. Assuming an eight-hour work day, the rock crushing average noise level at the closest project occupied homes would be approximately 64 dB or less and would be less than significant. The maximum noise level associated with impulsive noise from the primary crusher would be 72 dB or less at the closest project occupied homes. This noise level would comply with the County's impulsive noise criteria.

Based on a preliminary site development schedule, the drilling and blasting activities would occur during the rough grading activities at the site. Grading and blasting activities would begin at the southern portion of the project and continue in a northern direction. Grading and blasting in Development Phase I would be completed prior to occupancy of units in Development Phase I. Thus, there would be distance buffer between occupied units and construction activities. The minimum distance buffer would be 100 feet during grading activities. Grading noise would be less than a one-hour average noise level of 75 dB at the closest project occupied homes. A timeline of the phasing plan and anticipated occupancy in relationship to the ongoing grading/blasting/drilling activities is shown in Table 11. The development phasing of the project and neighborhoods are shown in Figure 21.

Table 11
Summary of On-Site Construction Phasing and Occupancy

Construction Phase	Residential Neighborhoods Anticipated to be Occupied	Year of First Occupancy	Distance from grading to Closest Lot	Distance from blasting/drilling to Closest Lot	Distance from rock crushing to Closest Lot	Potentially Significant Noise Impact
A	None		N/A	N/A	N/A	No
B	Neighborhoods 1 and 2 PA 3	2009	150' (Neighborhood 2 PA 3)	500' (Neighborhood 2 PA 3)	1,800' (Neighborhood 1 PA 6)	Yes (blasting/drilling)
C	Neighborhoods 1 and 2	2011	300' (Neighborhood 2 PA 2)	500' (Neighborhood 2 PA 2)	1,500' (Neighborhood 2 PA 2)	Yes (blasting/drilling)
D	Neighborhoods 1, 2, 3 and 4	2013	100' (Neighborhood 4 PA 2	500' (Neighborhood 4 PA 2)	600' (Neighborhood 4 PA 2)	Yes (blasting drilling)
E	Any	2015	> 1 mile	> 1 mile	> 1 mile	No

The closest project occupied homes to the drilling and blasting area would be approximately 500 feet. Assuming the construction activity operates continuously for a one-hour period, the average noise level at the closest future home would be approximately 78 dB assuming worst-case that

there is a direct line-of-sight from the drilling area to the closest future residents. This noise level would exceed the County's 75 dB noise criteria. Thus, the noise impact associated with the drilling and blasting activities is considered significant. The blast would be an impulsive noise event resulting in a maximum noise level of approximately 74 dB at the closest residence. The noise from the blast would comply with the County's maximum noise level standard for impulsive noise events.

Construction Truck Traffic Noise: The grading for the project is designed to be balanced, thus, there would be no import or export of dirt. Trucks would be used to deliver materials to the site. There would be a small percentage increase in truck traffic (less than 5 percent) as compared to the existing truck traffic in the area. The project's delivery trucks would generate an annual CNEL of less than 60 dB CNEL on the surrounding roads. Therefore, noise impacts associated with heavy trucks along the adjacent roads would be less than significant.

Construction Noise Associated with Off-Site Water and Sewer Pipelines

A water line would be installed off-site from west of the estate lots within Lawrence Welk Lane to Buckshot Lane. The pipeline construction would most likely be completed using open trench method within an existing access easement. Construction phases associated with the open-cut pipeline installing would include trenching, pipe laying, backfill/compacting and pavement reinstatement. The primary noise sources would most likely include an excavator/backhoe, loader, dump trucks, crew and delivery trucks, water truck, and roller compactor. There are two existing residences in the general vicinity of the water line and no existing residences adjacent to the proposed sewer line.

The closest home to the water line is approximately 120 feet from the pipeline alignment (Figure 22A). At this distance, the maximum noise levels would range up to approximately 80 to 85 dBA. Based on noise measurements of trenching, pipe laying, paving and compacting activities made by Dudek staff previously, the average noise level would range up to approximately 70 to 75 dB at a distance of 50 feet. The resulting noise level would be less than 70 dB at the closest homes. The duration to complete any phase of the open trench phases of the project such as trenching, backfilling, etc., will vary, but would typically proceed at a rate of approximately 50 to 100 feet per day. The construction activities would comply with the County's allowable hours and noise ordinance limits. Thus, the noise impact would be less than significant.

Off-site sewer lines would also be installed along a segment of Sarver Lane, and in Twin Oaks Valley Road from Del Roy Drive to Deer Springs Road (Figure 22B). The closest existing homes along Sarver Lane would are located approximately 50 feet from the sewer line. The exact

location of the pipeline within Twin Oaks Valley Road is currently unknown. There would be no homes located in the County of San Diego that would be within 50 feet of the sewer pipeline. The construction activities are to comply with Title 3, Division 6, Chapter 4 Section 36.410 of the County's Code of Regulatory Ordinances when construction occurs within the County's jurisdiction. There are approximately four homes located in the City of San Marcos that could be within approximately 40 feet of the sewer pipeline depending on the exact sewer line alignment. When the construction equipment is operating, the existing residences could be disturbed by the activities. The City's Municipal Code limits construction activities to the hours of 7:00 a.m. to 6:00 p.m. Monday through Friday, and on Saturdays 8:00 a.m. to 5:00 p.m. Construction activities at the site are expected to comply with the permitted hours of operation and the construction noise would not exceed noise levels typically considered acceptable for construction activities. Therefore, the construction noise impact would be less than significant.

Construction Noise Associated with Off-Site Road Improvements

Offsite road improvements would be required along Deer Springs Road and Twin Oaks Valley Road from approximately 1,000 feet south of Cassou Road to I-15. In general these roads would be widened from two to four lanes with additional turning lanes where necessary. The primary noise sources would most likely include a scraper, graders, loaders, paver, heavy trucks, crew and delivery trucks, water trucks, and roller compactors. Also, as previously discussed drilling and blasting would occur during widening of Deer Springs Road.

During construction operations, equipment moves to different locations and operates through varying load cycles, and there are breaks for the operators and for non-equipment tasks, such as survey measurements. Although maximum noise levels range up to 85 to 90 dBA, hourly average noise levels near the edge of the roadway, at locations where construction occurs would be anticipated to be 65 to 75 dBA at a distance of 90 feet. Construction noise at the receptors adjacent to Deer Springs Road/Twin Oaks Valley Road would exceed ambient traffic noise levels and would likely be perceived as nuisance noise. Disturbance would be periodic and non-contiguous and construction activities would be limited to the hours of 7 a.m. and 7 p.m. on weekdays and Saturdays in accordance with the County Noise Ordinance. When construction activities occur along Twin Oaks Valley Road, the construction activities would be limited to the hours of 7:00 a.m. to 6:00 p.m. Monday through Friday, and 8:00 a.m. to 5:00 p.m. on Saturdays in accordance with the City of San Marcos Municipal Code.

Single family residences, the Deer Springs Mobile Home park, a school, church and the Golden Door are located adjacent to this segment of Deer Springs Road/Twin Oaks Valley Road. Based on existing available information, the majority of the existing residences along Deer Springs

Road would be located 90 feet or more away from construction activity and would not be anticipated to be exposed noise levels in excess of the County's 75 dBA 8-hour average noise level standard. Also, the closest noise-sensitive outdoor use areas known at the Golden Door would be at least 200 or more feet from the construction area. However, the County also considers construction noise impacts to non-noise sensitive uses such as commercial and industrial uses. The Golden Door has several buildings used for commercial purposes adjacent to Deer Springs Road. At these buildings the 8-hour average noise level could range up to approximately 80 dB which would exceed the County's construction noise ordinance criterion. This impact is regarded as significant. In addition, near the intersection of Merriam Mountain Parkway and Deer Springs Road, the road widening construction would extend within approximately 30 feet of several existing mobile home residences. At this distance, the combination of larger equipment such as a scraper, grader, paving equipment, roller compactor and water truck would generate an 8-hour average noise level that would be approximately 80 dB. Also, four single family homes along Deer Springs Road would be located within 90 feet of proposed construction activity and may be exposed to hourly average noise levels exceeding the County's 75 dBA standard. This impact is regarded as significant.

The preliminary geotechnical information indicates that off-site drilling and blasting along Deer Springs Road could be necessary approximately 1,000 feet east of The Golden Door facility (J.T. Kruier 2008). This area would also be located approximately 700 feet or more from the closest residences. The resulting drilling and blasting hourly average noise levels are anticipated to be 75 dB or less at the closest noise sensitive receptors. At this distance, the drilling and blasting noise impact along Deer Springs Road would not exceed the County's significance criteria. If during the final geotechnical studies it is determined that off-site drilling and blasting would be required within 700 feet of existing noise-sensitive receptors' then noise mitigation would be provided.

Approximately 10 homes, a school and church are located adjacent to the proposed improvement area of Twin Oaks Valley Road. This segment of Twin Oaks Valley Road is flat and portions of the road bed have already been mostly constructed, with only minor grading anticipated in this area. Based on the construction equipment and distance to the closest residences, the construction noise is anticipated to generate an average sound level during an eight-hour work day of 75 dB or less. When the construction equipment is operating, the existing residences could be disturbed by the activities. Construction activities are expected to comply with the permitted hours of operation and the construction noise would not exceed noise levels typically considered acceptable for construction activities. Therefore, the construction noise impact would be less than significant.

6.0 MITIGATION

Noise mitigation measures are discussed for the on and off-site traffic noise impacts, commercial uses and construction activities as follows:

6.1 On-Site Traffic Noise Mitigation

Neighborhoods 1 and 2

To comply with the County of San Diego's exterior noise guideline, the proposed project would be required to reduce exterior noise levels at the usable open space areas of the residential building pads to a CNEL of 60 dB or less and interior living space noise levels to a CNEL of 45 dB. Specific mitigation measures cannot be determined at this time as more specific project information will be required. However, general mitigation measures could include any of the following:

Setbacks – Locating usable open space areas beyond the 60 dB CNEL as previously depicted in Table 6, for noise sensitive uses adjacent to Merriam Mountains Parkway, Meadow Park Lane and Deer Springs Road. Along I-15 the 60 dB noise contour at Neighborhood 1 Lot 4 was previously shown in Figure 6. Also, no buildings are to be exposed to noise levels greater than 75 dB CNEL. Thus, no buildings are to be located closer than 20 feet (one-story), 35 feet (two story), and 60 feet (three story) to the edge of the berm adjacent to I-15 at Neighborhood 1, Lot 4. At Neighborhood 2, no two story or higher buildings are to be located closer than 100 feet from the center line of Deer springs Road.

Noise Barriers – Construct berms, noise walls or a combination berm and noise wall. An approximate eight or nine-foot high noise barrier may be required adjacent to Merriam Mountains Parkway depending on the proximity of the outdoor noise sensitive areas to the road.

Site and Architectural Design – Alternatively, to mitigate the exterior noise associated with I-15 at Neighborhood 1, Lot 4 could require that the multi-family buildings completely enclose three sides of any outdoor usable area from I-15 traffic noise. Also, the buildings would have to be located so that the future exterior noise level at any floor of the building is 75 dB CNEL or less.

The future year 2030 traffic noise at the multi-family lots at Neighborhood 1, Lot 4 adjacent to I-15 can be mitigated to 60 dB CNEL at the first floor level with private and common use area setbacks. The future year 2030 unmitigated 60 dB and 75 dB CNEL noise contours were previously depicted in Figure 6. At multi-family buildings with exposure to I-15, no porches,

balconies or common usable space areas should be located on the north, south or east sides of a multi-family building. If private balconies are proposed they would most likely have to be located within the interior portion of the site and shielded by the multi-family buildings. Minimum building setback distances to the second and third floor levels to the 75 dB CNEL noise contour are shown in Figure 23. No buildings are to be located closer than these minimum setback distances to I-15 or the edge of the pad. These distances assume the construction of an eight-foot high berm. The berm would be located along the eastern portion of Neighborhood 1 Planning Area 2 as shown on the TM for the project. The berm is a project design feature, thus, it is required to be constructed and must be implemented and conditioned on the approved grading plans.

The future year 2030 traffic noise at the variable residential lots at Neighborhood 2, Lots 15 and 17 adjacent to Deer Springs Road can be mitigated to a 60 dB CNEL at the first floor level by an eight-foot high noise barrier at the edge of the building pad along with private and common use area setbacks. The location of a potential noise barrier is depicted in Figure 24. With an eight foot high sound wall, the setback distance would be approximately 40 feet from the edge of the pad at Lot 15, and approximately 70 feet from the edge of the pad at Lot 17. If private balconies are proposed they would most likely have to be located within the interior portion of the site shielded by the multi-family building. The future year 2030 unmitigated 60 dB and 75 dB CNEL noise contours were previously depicted in Figure 9a.

A noise study shall be required evaluating traffic noise at the variable residential lots at Neighborhood 1 Lots 4-6, 9-12 and Neighborhood 2 Lots 15-25 when site plans are prepared. Also, noise associated with commercial uses adjacent to residential uses shall be reviewed when site plans are prepared for the commercial uses, or if noise sensitive uses are proposed for the commercial lots. As part of the site plan review process for multi-family and commercial lots in Neighborhood 1 Lots 2, 3, 4-6, 9-12 and variable residential lots at Neighborhood 2 Lots 15-25. A “D1” designator is appropriate for the proposed multi-family residential and commercial lots because they can be feasibly mitigated through site design (i.e., noise barriers, setbacks, building orientation or a combination of these methods).

Neighborhoods 3, 4, and 5

Noise impacts shall be mitigated by constructing six-foot high barriers at single family lots adjacent to Merriam Mountains Parkway. In addition, six-foot high noise barriers would be required at Neighborhood 3, Lots 124-127 and 129-132 to mitigate the traffic noise from I-15.

The locations and noise barrier heights required to mitigate the future CNEL to 60 dB or less are depicted in Figures 25A and 25B. A summary of single family lots requiring noise mitigation and the top of barrier elevations are provided in Table 12.

Table 12
Noise Barrier Mitigation Summary for Proposed Single Family Homes

Neighborhood	Planning Area	Lot	Pad Elevation	Top of Barrier	Length of Return Wall (ft.)	Unmitigated First Floor CNEL	Mitigated First Floor CNEL
3	2	26	1251	1257	85	65	60
3	2	27	1253	1259	NA	65	60
3	2	28	1256	1262	NA	65	60
3	2	29	1258	1264	NA	65	60
3	2	30	1261	1267	NA	65	60
3	2	31	1264	1270	NA	65	60
3	2	32	1267	1273	NA	65	60
3	2	33	1270	1276	NA	65	60
3	2	34	1273	1279	NA	65	60
3	2	35	1276	1282	NA	65	60
3	2	36	1280	1286	NA	65	60
3	2	37	1283	1289	NA	65	60
3	2	38	1288	1294	NA	65	60
3	2	39	1292	1298	NA	65	60
3	2	40	1296	1302	NA	65	60
3	2	41	1299	1305	NA	65	60
3	2	42	1303	1309	NA	65	60
3	2	43	1307	1313	NA	65	60
3	2	44	1310	1316	NA	66	60
3	2	47	1317	R-O-W	Varies	65	60
3	2	48	1318	R-O-W	Varies	65	60
3	2	49	1319	R-O-W	Varies	64	59
3	1	112	1324	R-O-W	Varies	63	58
3	1	113	1324	R-O-W	Varies	63	58
3	1	124	1292	1298	NA	68	60
3	1	125	1291	1297	NA	68	60
3	1	126	1291	1297	NA	68	60
3	1	127	1291	1297	NA	64	59

Table 12
Noise Barrier Mitigation Summary for Proposed Single Family Homes

Neighborhood	Planning Area	Lot	Pad Elevation	Top of Barrier	Length of Return Wall (ft.)	Unmitigated First Floor CNEL	Mitigated First Floor CNEL
3	1	129	1295	1301	NA	64	59
3	1	130	1284	1290	NA	64	59
3	1	131	1281	1287	NA	64	59
3	1	132	1279	1285	NA	64	59
3	2	209	1284	1290	NA	61	56
3	2	210	1285	1291	NA	64	59
3	2	211	1285	1291	NA	64	59
3	2	212	1286	1292	NA	64	59
3	2	213	1287	1293	NA	64	59
3	2	214	1288	1294	NA	64	59
3	2	215	1289	1295	NA	64	59
3	2	216	1290	1296	NA	64	59
3	2	217	1291	1297	NA	64	59
3	2	218	1291	1297	NA	64	59
3	2	219	1292	1298	NA	64	59
3	2	220	1291	1297	NA	64	59
3	2	221	1291	1297	NA	64	59
3	2	222	1291	1297	NA	64	59
3	2	223	1290	1296	NA	64	59
3	2	224	1290	1296	NA	64	59
3	2	225	1289	1295	NA	64	59
3	2	226	1287	1293	NA	63	58
3	2	227	1286	1292	NA	63	58
3	2	228	1284	1290	NA	63	58
3	2	229	1282	1288	NA	63	58
3	2	230	1280	1286	NA	63	58
3	2	231	1277	1283	NA	63	58
3	2	232	1275	1281	NA	63	58
3	2	233	1273	1279	NA	63	58
3	2	234	1272	1278	NA	63	58
3	2	235	1271	1277	NA	61	56

Table 12
Noise Barrier Mitigation Summary for Proposed Single Family Homes

Neighborhood	Planning Area	Lot	Pad Elevation	Top of Barrier	Length of Return Wall (ft.)	Unmitigated First Floor CNEL	Mitigated First Floor CNEL
3	3	240	1269	1275	70	65	60
3	3	244	1293	1299	90	61	56
3	3	245	1296	1302	NA	61	56
3	3	246	1299	1304	NA	61	56
3	3	247	1302	1308	NA	61	56
3	3	248	1304	1310	60	61	56
3	3	271	1277	1283	NA	64	59
3	3	272	1276	1282	NA	64	59
3	3	273	1275	1281	60	64	59
4	2	281	1245	1251	NA	62	57
4	2	282	1245	1251	NA	62	57
4	2	283	1245	1251	NA	62	57
4	2	284	1246	1252	NA	62	57
4	2	285	1247	1253	NA	62	57
4	2	286	1248	1254	NA	62	57
4	2	287	1249	1255	NA	63	58
4	2	348	1289	1295	75	61	56
4	2	349	1288	1294	NA	61	56
4	2	350	1288	1294	NA	61	56
4	2	351	1287	1293	NA	61	56
4	2	352	1287	1293	NA	61	56
4	2	353	1286	1292	NA	62	57
4	2	354	1286	1292	NA	62	57
4	2	355	1285	1291	NA	62	57
4	2	356	1285	1291	NA	62	57
4	2	357	1284	1290	NA	62	57
4	2	358	1283	1289	NA	62	57
4	2	359	1284	1290	NA	63	58
4	2	360	1283	1289	NA	61	56
4	2	618	1238	1244	70	66	60
4	2	619	1237	1243	NA	66	60

Table 12
Noise Barrier Mitigation Summary for Proposed Single Family Homes

Neighborhood	Planning Area	Lot	Pad Elevation	Top of Barrier	Length of Return Wall (ft.)	Unmitigated First Floor CNEL	Mitigated First Floor CNEL
4	2	620	1237	1243	NA	66	60
4	2	621	1236	1242	NA	66	60
4	2	622	1236	1242	NA	65	60
4	2	623	1235	1241	NA	65	60
4	2	624	1235	1241	NA	63	58
4	2	625	1235	1241	NA	63	58
4	2	626	1234	1240	NA	63	58
4	2	627	1234	1240	NA	63	58
4	2	628	1233	1239	NA	64	59
4	2	629	1233	1239	NA	64	59
5	3	1161	1301	1307	NA	61	56
5	3	1162	1304	1310	NA	61	56
5	3	1163	1306	1312	NA	61	56
5	3	1164	1309	1315	NA	61	56
5	3	1165	1312	1318	NA	62	57
5	3	1166	1315	1321	NA	62	57
5	3	1167	1318	1324	NA	62	57
5	3	1168	1321	1327	NA	63	58
5	3	1169	1324	1330	NA	63	58
5	3	1170	1327	1333	NA	63	58
5	3	1171	1330	1336	NA	63	58
5	3	1172	1333	1339	NA	63	58
5	3	1173	1336	1342	NA	63	58
5	3	1174	1337	1342	30	63	58
Estate	1	1175	749	755 to 759	See Figure 26	75	60
Estate	1	1176	756	762 to 765	See Figure 26	73	60
Estate	1	1177	753	761	See Figure 26	72	60

Note: Right-of-Way (R-O-W) noise contour would be located within the roadway right-of-way.

The noise barriers may be constructed as a wall, berm or combination of both. The materials used in the construction of the barrier are required to have a minimum surface density of 3.5 pounds per square foot. They may consist of masonry material, 5/8-inch thick Plexiglas, 1/4-inch thick plate glass or a combination of these materials. The barriers must be designed so there are no openings or cracks.

In addition to the exterior noise criteria, the County requires that indoor noise levels not exceed a CNEL of 45 dB. Building plans for the homes have not been prepared. Typically, with the windows open, the building shells of homes provide approximately 15 dB of noise attenuation. Therefore, the single family residences exposed to exterior noise levels exceeding a CNEL of 60 dB could have interior noise levels greater than a CNEL of 45 dB. An interior acoustical analysis would be required for the lots exposed to a CNEL greater than 60 dB prior to issuance of building permits to ensure that the interior noise levels would not exceed a CNEL of 45 dB.

Therefore, an interior noise study shall be prepared for the following lots:

- Neighborhood 3, Lots 26-49, 112, 113, 124-127, 129-132, 209-235, 240, 244-248 and 271-273.
- Neighborhood 4, Lots 281-287, 348-360 and 618-629.
- Neighborhood 5, Lots 1161-1174

Estate Lots

Noise impacts shall be mitigated by constructing six-to-ten-foot-high barriers at Lots 1175 through 1177 adjacent to I-15. The locations and noise barrier heights required to mitigate the future CNEL required outdoor usable area to 60 dB or less are depicted in Figure 26. Also, the homes at the estate lots are limited to one-story in height.

6.2 Off-Site Traffic Noise Mitigation

Buena Creek Road:
The project would contribute 4,710 ADT along Buena Creek Road, between Monte Vista Drive to Deer Springs Road, which would add one dB to the near-term cumulative noise increase of four dB CNEL. This four dB CNEL noise level increase would exceed County Planning Department's significance threshold at the backyards of approximately 30 residences along Buena Creek Road between Monte Vista Drive and Twin Oaks Valley Road. The future noise levels would range between approximately 61 and 70 dB CNEL at the noise sensitive areas of these residences. Based on a preliminary review, construction of six to eight-foot high sound

attenuation barriers at the top of slope of the backyards could mitigate the noise level by five dB or more. There are a number of homes that could not be mitigated with a noise barrier at the road because of such conditions as the homes being above the road or having driveway openings along Buena Creek Road that would limit the potential noise reduction. Although encroachment permits within the right-of-way can be obtained from San Diego County, the feasibility of implementing this measure depends on obtaining permission from private property owners outside the public right-of-way. If such consent cannot be obtained to construct the barriers, the cumulative traffic noise impact at Buena Creek Road is significant and unavoidable. Also, the project's contribution to the mitigation measure should be proportional to the impact of the project.

Deer Springs Road:
The noise impact along Deer Springs Road could be reduced to at or below the County's significance threshold by constructing a six-foot high noise barrier along the Deer Springs Mobile Home park and six to eight-foot high noise barriers at five single family residences along Deer Springs Road (see Table 13). The locations of the noise barriers based on preliminary road improvement design plans were previously depicted in Figures 12A through 12D. The existing and future noise levels are shown in Table 7. The sound wall depicted on Figure 12B for noise modeling Receptor 5 would be offset from this receiver location. This is because there is existing topography directly between the receptor location and Deer Springs Road that would continue to attenuate a portion of the traffic noise from this road. The noted sound wall would reduce some of the traffic noise west of this receptor site where the topography would not shield the receptor.

A condition of approval will require the project applicant to construct a permanent noise barrier at selected locations that will reduce noise affecting identified sensitive receptors so that the noise level increase does not exceed the County's noise significance threshold criteria. The applicant will construct the required noise barriers that are determined to be feasible as part of the construction improvements along Deer Springs Road.

It should be noted that at Receptor 18 the direct noise impact (existing plus project traffic volumes) along the widened Deer Springs Road would also be mitigated as part of the existing plus project plus cumulative noise impact..

Table 13
Existing and Future and Mitigated CNEL at Various Noise Receptor Locations Along Deer Springs Road

Receptor	Existing	Existing + Project[1]	Existing + Cumulative[2]	Existing + Project + Cumulative[3]	Noise Level Increase[4]	Mitigated Noise Level[5]
1	63	66	64	67	4	63
2	64	67	66	68	4	64
3	66	69	68	70	4	67
4	67	70	68	71	4	67
5	64	67	65	68	4	67
17	62	65	64	66	4	64
18	62	66	63	67	5	65
19	63	66	64	67	4	65

Notes:
1 Existing Plus Project Traffic Volumes; 4-Lane Deer Springs Road
2 Existing Plus Cumulative Project Traffic Volumes; Existing Deer Springs Road
3 Existing Plus Project Plus Cumulative Projects Traffic Volumes; 4-Lane Deer Springs Road
4 Existing vs. Existing Plus Project Plus Cumulative Projects
5 Existing Plus Project Plus Cumulative Projects
Bold = Exceeds Significance Threshold
N/A = Not Applicable
Sound levels rounded to the nearest whole dB CNEL
The existing + project, existing + project + cumulative and mitigated noise levels incorporate the realignment and widening of Deer Springs Road

6.3 Commercial Development Noise Mitigation

Noise could be mitigated by limiting the hours of operation; designing site plans to minimize areas of noise exposure to adjacent residences; select and locate HVAC equipment to comply with the County's noise ordinance; and/or construct intervening noise barriers.

Commercial areas are only occupied a portion of the day, therefore, noise sensitive areas at the commercial areas should not be exposed to noise levels greater than a peak hour one-average sound level of 60 dB. The interior noise level, due to outside noise, should not exceed one-hour average sound level 50 dB for rooms that are usually occupied only a part of the day (schools, libraries, or similar). Also, the interior noise level within the habitable rooms of the fire station should not exceed 45 dB CNEL.

A noise study shall be required evaluating traffic noise at the variable residential lots at Neighborhood 1, Planning Areas 1 and 2; and commercial lots at Neighborhood 1 when site

plans are prepared. To facilitate review by the County a "D1" designator for noise should be included in the zoning of Neighborhood 1, Planning Areas 1 and 2.

6.4 Construction Noise and Vibration Mitigation

Drilling and Blasting

The proposed project could result in a significant noise impact during construction activities if drilling and blasting activities are within 700 feet from the existing or project occupied residences. Mitigation measures include selecting a quieter rock drill, constructing a temporary noise barrier around the drill rig, or a combination of these two methods to achieve the County's noise criteria. A rock drill with a lower noise level than the noisiest rock drills can be used with a corresponding smaller setback distance. For example, a drill rig that generates a noise level of 89 dB at 50 feet would require a minimum setback distance of 250 feet from the closest existing or project occupied residence (*Attachment 3*). A temporary noise barrier located around the rock drill could also be used. The height of the noise barrier would depend on several factors including the rock drill noise level, distance from the drill rig to the receiver, and the elevation of the drill rig relative to the receiver. Depending on various geometric and design factors, a temporary noise barrier could attenuate the drilling noise by approximately 5 to 15 dB. Assuming a temporary noise barrier is constructed approximately 20 feet from the drill rig, that the closest receptor is 50 feet from the drill rig, and both the drill rig and receiver are at the same elevation, then a 14-foot high noise barrier would mitigate the eight-hour average noise level to 75 dB. With a 12-foot high noise barrier the noise would be mitigated at a distance of 70 or more feet. A minimum 12-foot high noise barrier shall be constructed if a noise barrier is necessary to reduce the noise level to a eight-hour average sound level of 75 dB or less. A noise monitoring plan will be required if a noise barrier is located within 70 feet of the property line of an occupied residence. The noise barriers would be temporary for approximately six-months at any one location.

The temporary barrier could be constructed of minimum 3/4-inch thick plywood with R-11 fiberglass insulation batts attached to the interior of the panels. Alternatively, temporary portable barriers, made from a variety of materials, are available from various noise control manufacturers (i.e., Empire Acoustical Systems, Industrial Acoustics Company and Kinetics Noise Control).

Alternatively, based on the distances to the closest noise sensitive receivers, quieter rock drills, such as a rock drill with a sound level of approximately 85 dB at 50 feet in the direction of the noise sensitive receiver, would mitigate the noise impact at the closest noise-sensitive receptor to

the drilling and blasting areas without the need for a temporary barrier. Also, the hours of equipment use per day could be reduced. For example, in terms of the eight-hour average sound level, drilling four hours per day with a drill generating 88 dB at 50 feet is equivalent to drilling eight-hours a day with a drill generating 85 dB at 50 feet.

Any rock drill used at the site shall be tested by a County-approved acoustical consultant prior to use on the project site. The results of the sound tests shall be filed with the County DPLU. The report shall summarize the results of the sound test and method of compliance with the County's noise ordinance criteria (i.e., demonstrate that the rock drilling would be located far enough from the property lines or that a temporary noise barrier around the drill would mitigate the eight-hour average noise level to 75 dB or less at the adjacent property lines). The report shall be approved by the County prior to commencement of drilling. Occupancy shall be phased so that the closest occupied residence to a blasting or drilling area is located a minimum 700 feet away as part of the grading plan permit process.

In addition, the proposed project would conduct blasting activities consistent the requirements contained within a blasting permit for the County of San Diego and USBM. These items may include, but not be limited to the following:

a. Pre-blast inspection of all structures within 300 feet of blasting site unless inspection is waved by the owner/occupant.

b. Identify the site and location of planned blasting and hours of operation (blasting to be conducted between 7:00 a.m. and 5:00 p.m. Monday through Saturday)

c. Notification of blasting activities to all property owners within 600 feet of the blasting area. This notification shall describe expected period and frequency that the blasting shall occur and give a contact phone number for any questions or complaints. All complaints shall be responded to in a method deemed satisfactory to the County of San Diego Director of Planning.

d. Warning system information

e. Compliance with local, state and federal laws

f. The blasting contractor shall monitor and record vibration and air blast for major blasts (as defined in Section 35.37701.2 of the County Code of Regulation Ordinances) within 600 feet, or minor blasts within 300 feet of residences and other occupied structures. If permission cannot be obtained to record at said location, recording shall be accomplished at some closer site in line with the structure. Specific locations and distances where air

blast and vibration are measured shall be documented in detail along with measured air blast and vibration amplitudes.

1. Blast vibration and air blast are to be within the recommended frequency dependent limits contained in the USBM regulations outlined in Figure 16 at the location of any residential dwelling, business, public building, school, church, community or institutional building outside the permit area. If blasting is found to exceed specified levels, blasting shall cease, and alternative blasting or excavation methods that result in the specified levels not being exceeded shall be employed.

2. All structures in the vicinity of the blasting area not listed such as water towers, pipelines and other utilities etc., shall be protected from damage by the blaster on a case-by-case basis.

g. Pre-blast inspection reports shall be retained by the blaster and upon a complaint of alleged damage the blaster shall cause a copy of the report to be immediately filed with the Sheriff. A copy shall also be sent to any individual who is directly involved in the complaint upon their request.

h. The blaster shall cause an approved inspector to conduct a post-blast inspection of all structures for which written complaints alleging blast damage have been received. A written report of such inspection shall be immediately filed with the Sheriff and delivered or sent to individuals directly involved in any alleged damage within sixty (60) days of receipt of a complaint.

A disclosure statement shall be provided to home buyers within the project site stating that they will be exposed to noise from construction activities during the remaining phases of development.

Off-Site Construction Noise Mitigation

If unmitigated, the construction noise level would exceed the County's eight-hour average 75 dB significance threshold at the mobile home park. A temporary sound wall at the Deer Springs Road future roadway top edge of slope adjacent to the mobile home park would shield the residences directly below the road and reduce the noise to 75 dB Leq or less at the mobile home park (Table 14). The location of the temporary noise barrier is shown in Figure 27 and it is recommended that the temporary noise barrier be a minimum of 12-feet in height along the entire barrier length. As the road is graded down, the temporary noise barrier would continue to provide noise attenuation as illustrated in the cross-sections (Figures 28A and 28B). These cross-

sections refer to a 12-foot temporary noise barrier based on currently available design information. The noise barrier should be installed just prior to Deer Springs Road grading activities adjacent to the mobile home park. The temporary barrier can be removed when grading has been completed along Deer Springs Road adjacent to the Deer Springs mobile home park, and construction has progressed to the point where the permanent six-foot high sound wall can replace the temporary barrier.

- Construct 10-foot high temporary noise barriers adjacent to four residences as depicted on Figure 29 and along the southern limits of Deer Springs Road adjacent to commercial uses at the Golden Door Property. With these noise barriers, the eight-hour average noise level is anticipated to be reduced to 75 dBA or less at these residences.

- The temporary noise barriers shall be constructed with a minimum of 3/4-inch thick plywood with R-11 fiberglass insulation batts attached to the interior of the panels. Alternatively, temporary portable barriers, made from a variety of materials, are available from various noise control manufacturers (i.e., Empire Acoustical Systems, Industrial Acoustics Company and Kinetics Noise Control). In addition, as soon as practical after the grading has been completed, the permanent noise barriers as previously shown in Figures 12A-12D shall be constructed.

The following additional measures are recommended to minimize construction noise impacts:

- Residents and business owners fronting Deer Springs Road and Twin Oaks Valley Road should be notified in advance of planned work near their properties.

- Contractors should be required to have and maintain mufflers of original equipment grade or better on all engines. This also applies to subcontractors with haul trucks.

- Other measures which that could be implemented would consist of designing construction schedules and activities such that noise levels in proximity to noise sensitive receptors don't exceed the 8-hour limit (this may require interrupting and lengthening the construction period) or; relocating sensitive receptors to alternate housing during the construction period.

Table 14
Temporary Barrier Noise Attenuation at Deer Springs Mobile Home Park

	Cross-Section			
	A	B	C	D
Source to Barrier	10	10	10	10
Barrier to Receiver	40	30	40	70
Receiver height	965	981	987	992

Table 14
Temporary Barrier Noise Attenuation at Deer Springs Mobile Home Park

	Cross-Section			
	A	B	C	D
Source height	976	995	999	1005
Barrier Elevation	966	984	986	994
Barrier height	12	12	12	12
Barrier Attenuation	11	11	6	8
Mitigated Sound Level	≤ 75	≤ 75	≤ 75	≤ 75

Note: All distances in feet, elevations feet amsl

As noted above, mitigation measures would include placing a temporary noise barrier adjacent to construction activities, in an attempt to reduce the noise levels during construction below a 8-hour average sound level of 75 dB or less; however due to driveway openings and proximity to property lines the noise impacts are conservatively determined to remain significant and unmitigable during construction. The placement of a temporary noise barrier adjacent to the mobile home park and four single-family residences would reduce noise levels during construction for residences located within the mobile home park and along Deer Springs Road; however impacts would remain significant and unmitigable during construction.

Per the County of San Diego Noise Ordinance Amendment Effective January 9, 2009, Section 36.423 a Variance from the Noise Ordinance for construction noise is subject to approval for a person who proposes to perform non-emergency work on a public right-of-way, public transportation facility or some other project for the benefit of the general public, who is unable to conform to the requirements of the Noise Ordinance, may apply to the County for a variance authorizing the person to temporarily deviate from the Noise Ordinance requirements.

Therefore, the project applicant should apply for a noise variance per Section 36.423 of the County of San Diego Noise Ordinance Amendment effective January 9, 2009, A variance can be used for projects that propose to perform non-emergency work on a public right-of-way, public transportation facility or some other project for the benefit of the general public who is unable to conform to the requirements of the Noise Ordinance during construction.

7.0 PROJECT ALTERNATIVES

Six alternatives to the proposed project are proposed: (1) No Project/No Development Alternative; (2) No Project/Existing General Plan Alternative; (3) 785-Unit Reduced Footprint; (4**)** 1,300 Unit Reduced Project Footprint; (5) General Plan Update; and (6) Offsite Roadway Improvements along Deer Springs Road. Specific information regarding the alternatives is discussed in the project's EIR. The following discussion provides a comparison of the noise

impacts associated with the proposed project versus each alternative. A comparison summary of the proposed project with the Project Alternatives is provided in Table 15.

Table 15
Noise Impact Summary of Alternatives

Alternative	Level of Impact Compared to Proposed Project
No Project/No Development	No impact
No Project/Existing General Plan	Less construction noise, reduced off-site traffic noise impacts Will require "D1" designator and noise protection easements
785-Unit Reduced Footprint	Less construction noise, , reduced off-site traffic noise impacts Cumulatively significant and unavoidable impacts for noise increase due to project-generated traffic along Buena Creek Road would be reduced to less than significant under this alternative.
1,300 Unit Reduced Project Footprint	Similar to proposed project, but less construction noise and off-site traffic noise. Cumulatively significant and unavoidable impacts for noise increase due to project-generated traffic along Buena Creek Road would remain significant and unavoidable under this alternative.
General Plan Update	Less construction noise, greater off-site traffic noise impacts due to commercial land uses generating additional vehicle trips
Offsite Roadway Improvements along Deer Springs Road	Similar to the proposed project, however a significant and unavoidable noise impact during construction would result for residences located at the mobile home park adjacent to roadway improvements along Deer Springs Road.

7.1 No Project/No Development Alternative

Under this alternative no development would occur, and resulting construction and operational noise impacts of the proposed project would be avoided.

7.2 No Project/Existing General Plan Alternative

Due to the fewer number of residential units, and each individual parcel being developed separately, the resulting construction noise under this alternative would be substantially less than the proposed project. Short-term noise impacts associated with construction traffic, blasting, rock-crushing, and earthmoving equipment during construction of the proposed project would be substantially reduced under this alternative. Due to the fewer number of residential units and resulting vehicle trips compared to the proposed project, this alternative would result in a reduced level of operational noise. It is anticipated that improvements to Deer Springs Road would be necessary under this alternative, similar to the proposed project. Neither this alternative nor the proposed project would result in significant unavoidable noise impacts during construction.

7.3 785 Unit Reduced Footprint Alternative

Due to the relatively similar size and scale of this alternative compared to the proposed project, construction noise associated with construction traffic, blasting, rock-crushing, and earthmoving equipment would be similar. Due to fewer dwelling units compared to the proposed project, operational noise associated with vehicle trips would be less than the proposed project. It is anticipated that improvements to Deer Springs Road would be necessary under this alternative, similar to the proposed project.

Due to fewer dwelling units compared to the proposed project, operational noise associated with vehicle trips would be less than the proposed project. Cumulatively significant and unmitigated impacts for noise increase due to project generated traffic along Buena Creek Road would be reduced to less than significant under this alternative. The vehicle trips contribution under this alternative along Buena Creek Road would be reduced from 20,000 ADT to 17,400 ADT, therefore reducing the noise increase from 4dB to 3dB. This alternative would likely require similar internal noise mitigation measures consisting of sound walls; however vehicle trips along internal roadways would be reduced due to the reduced the number of dwelling units. This alternative would result in less than significant operation impacts along Buena Creek Road that were identified as significant and unmitigated under the proposed project because permission to construct sound walls on some private property would not be required. Neither this alternative nor the proposed project would result in significant unavoidable noise impacts during construction.

7.4 1300 Unit Reduced Footprint Alternative

Construction-related noise impacts under this alternative would be similar as under the proposed project as the development footprint would be essentially identical to the proposed project, with the exception of elimination of multifamily development in the southeastern portion of the site.
Noise walls and barriers would be needed under this alternative as under the proposed project given the location of project development along internal project streets that would likely carry similar, though slightly reduced, levels of traffic as would occur under the proposed project. It is anticipated that improvements to Deer Springs Road would be necessary under this alternative and impacts would be similar to those for the proposed project. Also, construction noise may impact California gnatcatcher habitat. Biologists would have to determine the significance of the impact and potential mitigation such as biological mitigation areas. Cumulatively significant and unmitigated impacts for noise increase due to project generated traffic along Buena Creek Road would remain significant and unmitigated under this alternative. The vehicle trips contribution

under this alternative along Buena Creek Road would be 18,200 ADT, which would remain above the threshold of significance for a cumulative noise contribution increase of over 3dB. Therefore significant and unavoidable noise impacts during operation along Buena Creek Road would be significant similar to the proposed project.

7.5 General Plan Update

The lot-by-lot nature of development anticipated under this alternative would generally reduce construction-related noise impacts under this alternative. Cumulatively significant and unmitigated impacts for noise increase due to project generated traffic along Buena Creek Road would remain significant and unmitigated under this alternative. The projects vehicle trips contribution along Buena Creek Road would be 18,370 ADT, which would remain above the threshold of significance for a cumulative noise contribution increase of over 3dB. Therefore significant and unavoidable noise impacts during operation along Buena Creek Road would occur similar to the proposed project.

7.6 Off-Site Roadway Improvements along Deer Springs Road

Long-term noise impacts associated with vehicle trips from the alternative roadway alignment would not differ than the proposed project. The proposed project and alternative alignment of Deer Springs Road would require a six-foot sound wall to mitigate for the off-site traffic noise along Deer Springs Road adjacent to the mobile home park. Therefore under this alternative long term impacts would be similar to those for the proposed project.

Noise would be generated during construction Deer Springs Road through grading for the proposed alignment of the roadway improvements. To accommodate the proposed alternative alignment, a retaining wall would need to be constructed adjacent to the mobile home park in order to raise the elevation of the roadway to place fill over two cultural resource sites located near the intersection of Deer Springs Road/Mesa Rock Road. The modular keystone wall being constructed adjacent to the mobile home park would include excavating a shallow trench to place gravel to serve as the foundation for the wall base. The wall would then be raised through the placement of geo-grid fabric to serve as the base for each layer of modular keystone wall added. The modular keystone wall would consist of inter-locking segments that would be placed on top of one another to form the wall. Near the intersection of Merriam Mountain Parkway and Deer Springs Road the roadway widening construction would extend within approximately 20 feet of existing mobile home residences. At this distance, the combination of larger equipment such as a scraper, grader, paving equipment, roller compactor and water truck would generate a one-hour average noise level that would be approximately 80 dB. During the widening of Deer Springs

Road, the project would result in unavoidable short-term construction noise impact at approximately five existing residences located along the south side of Deer Springs Road near Merriam Mountains Parkway. The construction activities would occur for approximately three to four months adjacent to the mobile home park area.

Several potential mitigation measures were explored that could be implemented during construction to minimize impacts from construction related noise; however noise impacts during construction could not be reduced to a level below significance. For example, the construction of a noise barrier during construction was considered however it would not be feasible because the slope would constantly be increasing in height as the fill material is placed. Therefore, under this alternative significant unavoidable construction noise impacts associated with construction of Deer Springs Road would occur that would not occur under the proposed project.

8.0 GENERAL PLAN AMENDMENT–CIRCULATION ELEMENT

The Circulation Element Amendment proposes three modifications to the County of San Diego Circulation Element: (1) reclassification of Deer Springs Road from a four-lane Major Road to a six-lane Prime Arterial between Champagne Boulevard and the City of San Marcos city limit/Twin Oaks Valley Road; (2) deletion of the planned Circulation Element roadway segment of Buena Creek Road extending westerly from its intersection with Deer Springs Road; and (3) elimination of the planned bicycle path along the segment of Buena Creek Road described in (2). The Circulation Element Amendment is analyzed separately from the remainder of the project because it is needed to accommodate traffic that would be generated by the adopted Land Use Element of the General Plan, even without additional traffic generated by development of Merriam. Analyzing the potential noise impacts of the Circulation Element Amendment separately in this section allows the County to ensure that the Circulation Element of the General Plan is consistent with the existing Land Use Element, as well as the remainder of the project.

Existing Conditions

Deer Springs Road has an existing traffic volume ranging from approximately 14,900 ADT to 18,400 ADT (LLG 2009). Existing noise levels along Deer Springs Road range up to approximately 75 dB CNEL immediately adjacent to the edge of this two-lane road.

Noise sensitive receptors located within the vicinity of the Deer Springs Road corridor include single-family residential, resort/spa and a mobile home park. Noise sensitive receptors located within the vicinity of the proposed Buena Creek road extension removal include single-family residences.

Future Conditions

Operation:

Future 60 dB CNEL noise contour distances were calculated using Caltrans' SOUND32 traffic noise prediction model with California vehicle noise emission factors and future year 2030 traffic volumes. The future year 2030 traffic volume is projected to be approximately 51,100 ADT along Deer Springs Road between Mesa Rock to Twin Oaks Valley Road under the current adopted Circulation Element road classification (i.e., four-Lane Major Road) (Linscott, Law and Greenspan, 2008). With the Circulation Element Amendment (i.e., six-lane Prime Arterial) the future year 2030 traffic volume would be approximately 44,000 along Deer Springs Road between Mesa Rock to Twin Oaks Valley Road (Linscott, Law and Greenspan, 2008).

For purposes of analysis two roadway scenarios were evaluated to determine the potential noise impacts that may occur from reclassification of Deer Springs Road to a six-lane Prime Arterial under the Circulation Element Amendment.

Existing Noise Level Compared to Proposed Circulation Element Amendment (6-lane Prime Arterial) – The increase in the existing 60 dB CNEL traffic noise contour distance associated with the existing two lane roadway in comparison to future (year 2030) traffic noise level that would occur under the proposed reclassification and alignment is shown in Figure 30A. The noise level contour distances are based on level topography, soft site sound propagation conditions.

The Plan (6-lane Prime Arterial) to Ground (existing 2-lane road) scenario compares the change in noise from the existing two-lane roadway to the proposed Prime Arterial classification along Deer Springs Road. The Circulation Element Amendment would expose several residences adjacent to the Deer Springs Road alignment to noise levels in excess of 60 dB CNEL as a result of the proposed roadway widening to six-lane Prime Arterial standards that would place vehicle generated noise in closer proximity to sensitive receptors than the existing two-lane road (see Figure 30A) and greater future traffic volumes as compared to the existing volumes. Therefore, the roadway reclassification would likely result in noise impacts to single-family residences, a mobile-home park and resort/spa, which are considered sensitive receptors (see Figure 30A). This exposure of sensitive receptors to noise levels significantly exceeding the ambient noise level or exceeding 60 dB CNEL could result in a significant noise impact.
Based on a traffic volume increase from the existing 16,300 ADT to future (year 2030) 44,000 ADT the existing noise level would increase by approximately four dB CNEL. Thus, the

existing noise sensitive receptors would not be subjected to noise 10 dB CNEL over existing noise levels due to the traffic volume increase. It should be noted that future projects that may be located adjacent to the roadway improvement area will be required to complete a noise evaluation at the time the projects are proposed.

Adopted Circulation Element Compared to Proposed Circulation Element Amendment Noise Levels – The future (year 2030) 60 dB CNEL noise contours associated with the existing adopted Circulation Element four-lane Major Road and assumed alignment, in comparison to the proposed Circulation Element Amendment and alignment are shown in Figure 30B. The noise level contour distances are based on level topography, soft site sound propagation conditions.

The Plan to Plan scenario compares the noise levels that would result from the implementation of the currently Adopted Circulation Element (4-lane Major Road) to the Circulation Element Amendment (6-lane Prime Arterial Road). The proposed reclassification along Deer Springs Road from the adopted classification (four-lane Major Road) to a six-lane Prime Arterial would result in exposure of sensitive receptors to noise levels in excess of 60 dB CNEL (see Figure 30B). However, the Circulation Element Amendment roadway reclassification would result in a slightly lower noise level and would thereby impact fewer sensitive receptors along Deer Springs Road with the Prime Arterial classification in comparison to the adopted Circulation Element Major Road classification. This is because the Prime Arterial classification roadway would have a reduced number of vehicle trips in comparison to the existing General Plan roadway classification. The reduced traffic volume along Deer Springs Road under the proposed GPACE would be the result of the elimination of the Buena Creek Road extension that would redistribute planned trips along Deer Springs Road to other nearby roadway segments. Even though there would a reduction in the traffic volume along this roadway segment, the anticipated vehicle trips and associated exposure of sensitive receptors to noise levels exceeding 60 dB CNEL could result in a significant impact.

The proposed GPACE would remove a new road (i.e., the Buena Creek Road extension) west of the Deer Springs Road/Sarver Lane curve from the Circulation Element Map. As seen in Figure 30C, the planned extension would introduce a new road within a mostly rural area that currently consists of single-family residential and agricultural uses. The proposed Circulation Element Amendment would not change existing noise conditions in this area. Instead, the proposed Circulation Element Amendment would avoid significant noise impacts to sensitive receptors that would occur under the currently adopted Buena Creek Road extension.

Construction:

The primary noise sources resulting from the widening of Deer Springs Road would most likely include a scraper, graders, loaders, paver, heavy trucks, crew and delivery trucks, water trucks, and roller compactors. The noise levels generated by construction equipment would vary greatly depending upon factors such as the type and specific model of the equipment, the operation being performed, and the condition of the equipment. The average sound level of the construction activity also depends upon the amount of time that the equipment operates and the intensity of the construction, which would occur during the County's allowable hours of operation.

Several homes and sensitive receptors are located adjacent to Deer Springs Road. Construction activities would occur in close proximity to existing sensitive receptors. Given the location of sensitive receptors from proposed reclassification improvements, construction equipment associated with roadway improvements would likely generate a one-hour average noise level, exceeding the one-hour 75 dB construction noise standard in the County Noise Ordinance. Drilling and blasting may also generate significant noise impacts to sensitive receptors along Deer Springs Road. Therefore, the construction noise would result in a significant noise impact at existing residences.

Ground-borne vibration and noise information related to construction activities has been collected by Caltrans (Caltrans 2004). Information from Caltrans indicates that continuous vibrations with a peak particle velocity of approximately 0.1 inches/second begin to annoy people. However, vibration is very subjective and some people may be annoyed at continuous vibration levels near the level of perception (or approximately a peak particle velocity of .01 inches/second). Due to the nature of construction activities and distance from sensitive receptors ground-borne vibration is not expected to result in continuous vibration levels that typically annoy people; therefore, impacts would be less than significant.

Mitigation

Noise impacts to noise sensitive land uses during operation shall be mitigated through compliance with the Noise Element of the General Plan and the County's Noise Ordinance. Given the fact that project-level detailed information is not currently available it is unclear whether noise levels could feasibly be reduced to below 60 dB.

The widening of Deer Springs Road would result in a short-term construction noise impact. Noise impacts would primarily occur during grading when the roadbed is being prepared.

Through construction being required to comply with the Noise Element of the General Plan and the County's Noise Ordinance would reduce the potential construction impacts to a level below significance because construction noise levels could be reduced through the placement of temporary sound walls adjacent to sensitive receptors. It should be noted the time period of the significant construction noise impact at any one residence would be substantially shorter because the equipment would operate with various load cycles and would be moving to different locations.

9.0 REFERENCES

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Dexter Wilson Engineering, December 16, 2004. *E-Mail Correspondence with Mr. Steve Wilson of Dexter Wilson and Mr. Drew Garner of Dudek & Associates.*

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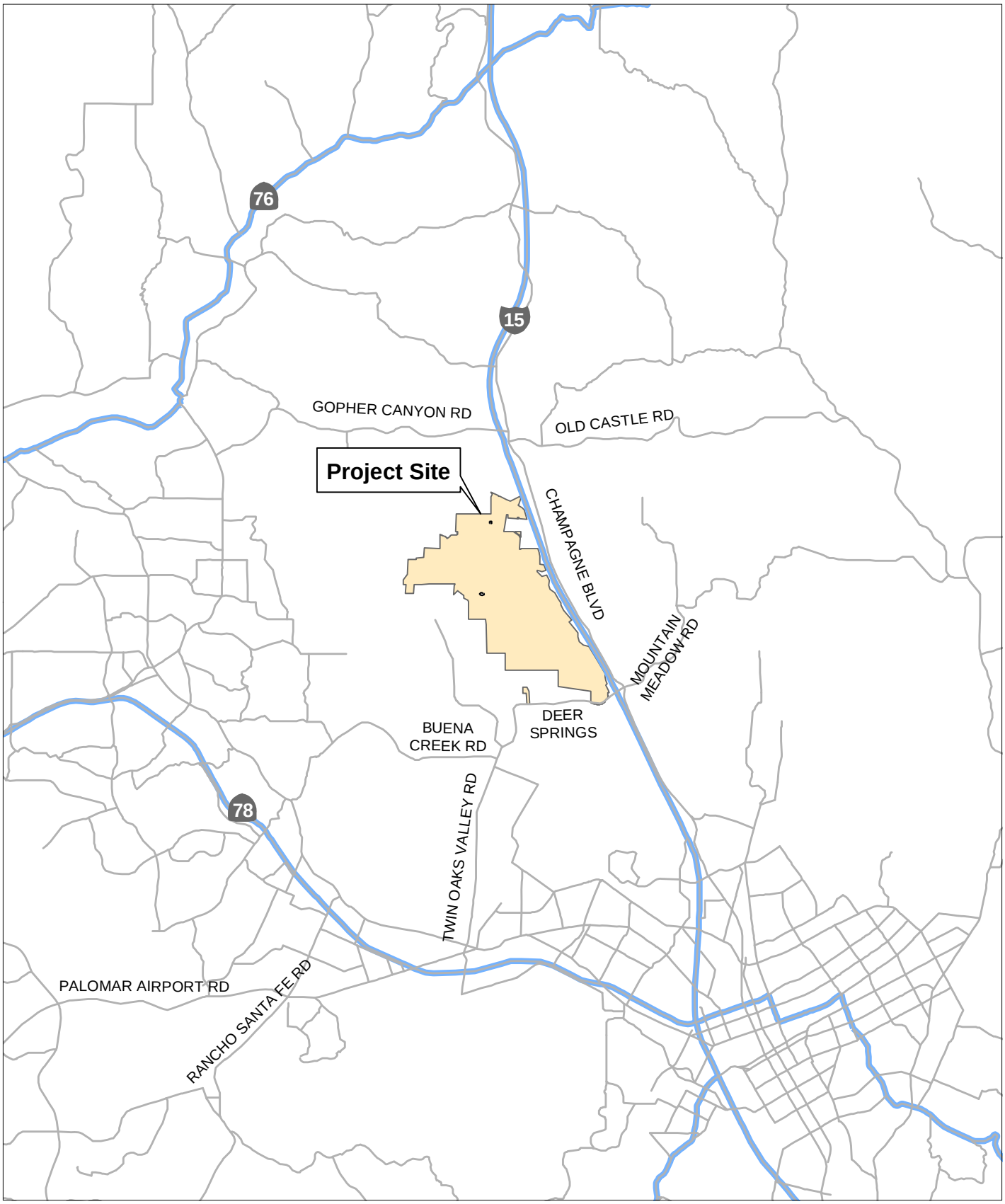


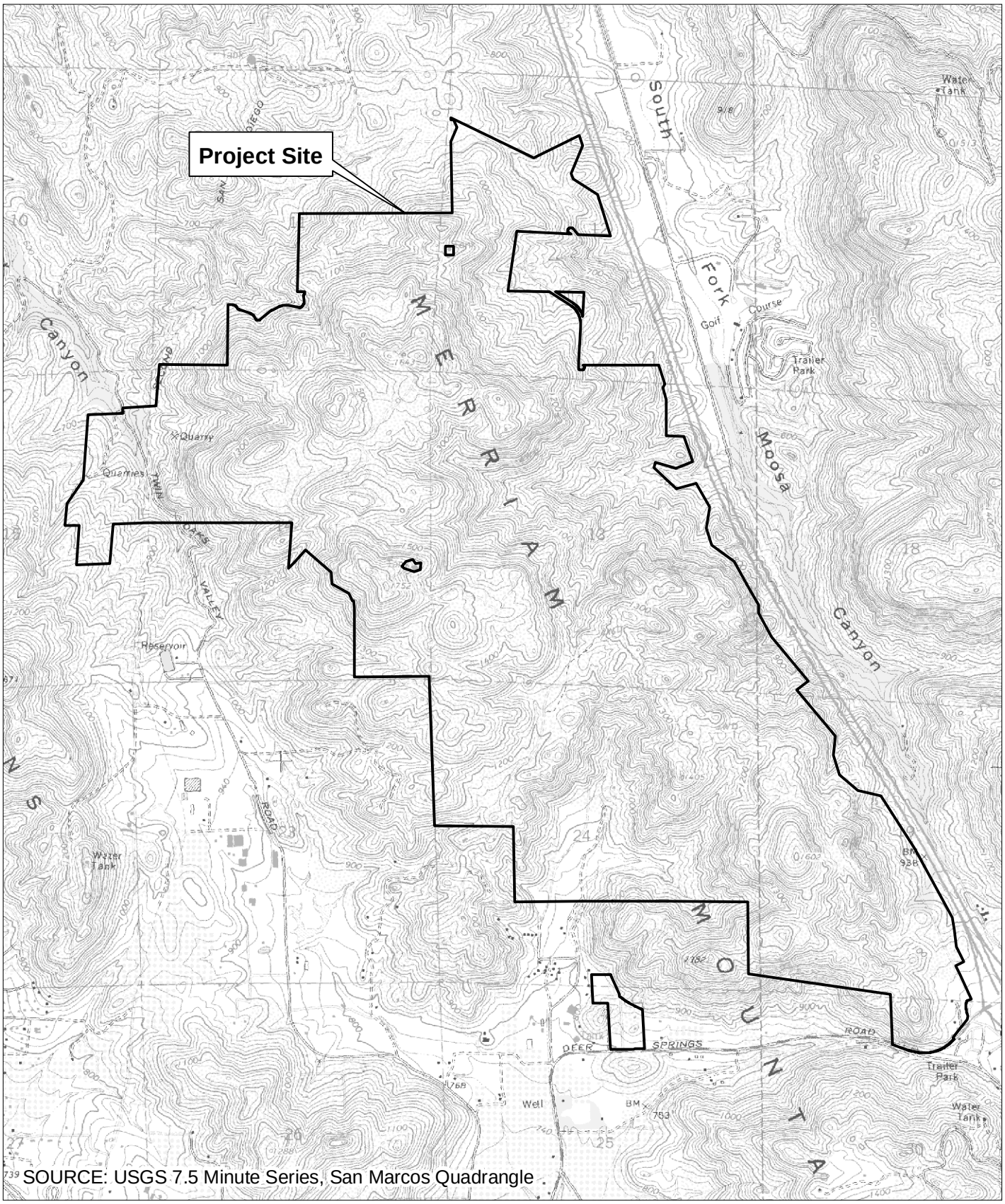
Regional Location

FIGURE 1

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

0 1 2 4
Miles

N



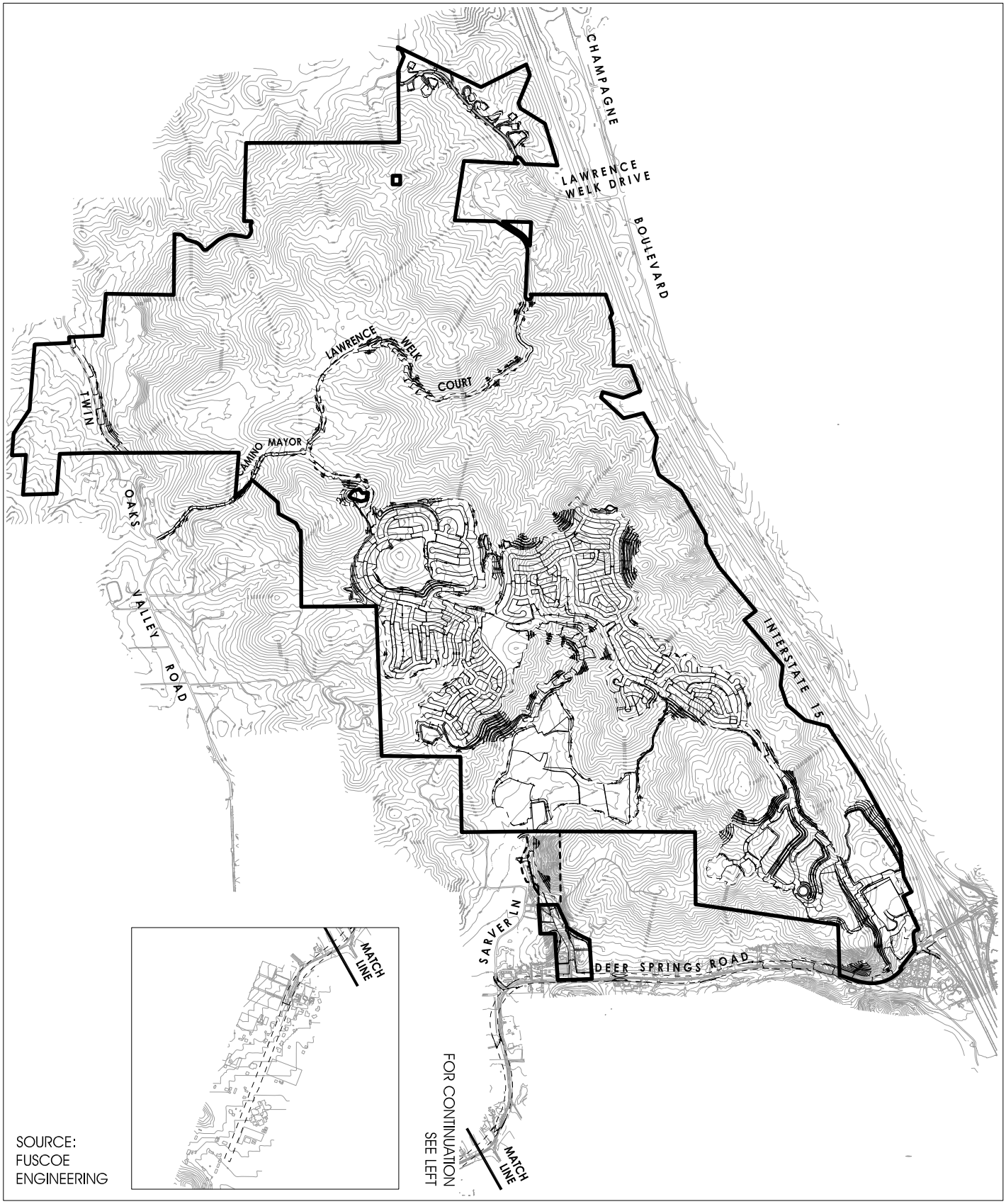
Project Vicinity

FIGURE 2

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

0 1,200 2,400 4,800
Feet

N



SOURCE:
FUSCOE
ENGINEERING

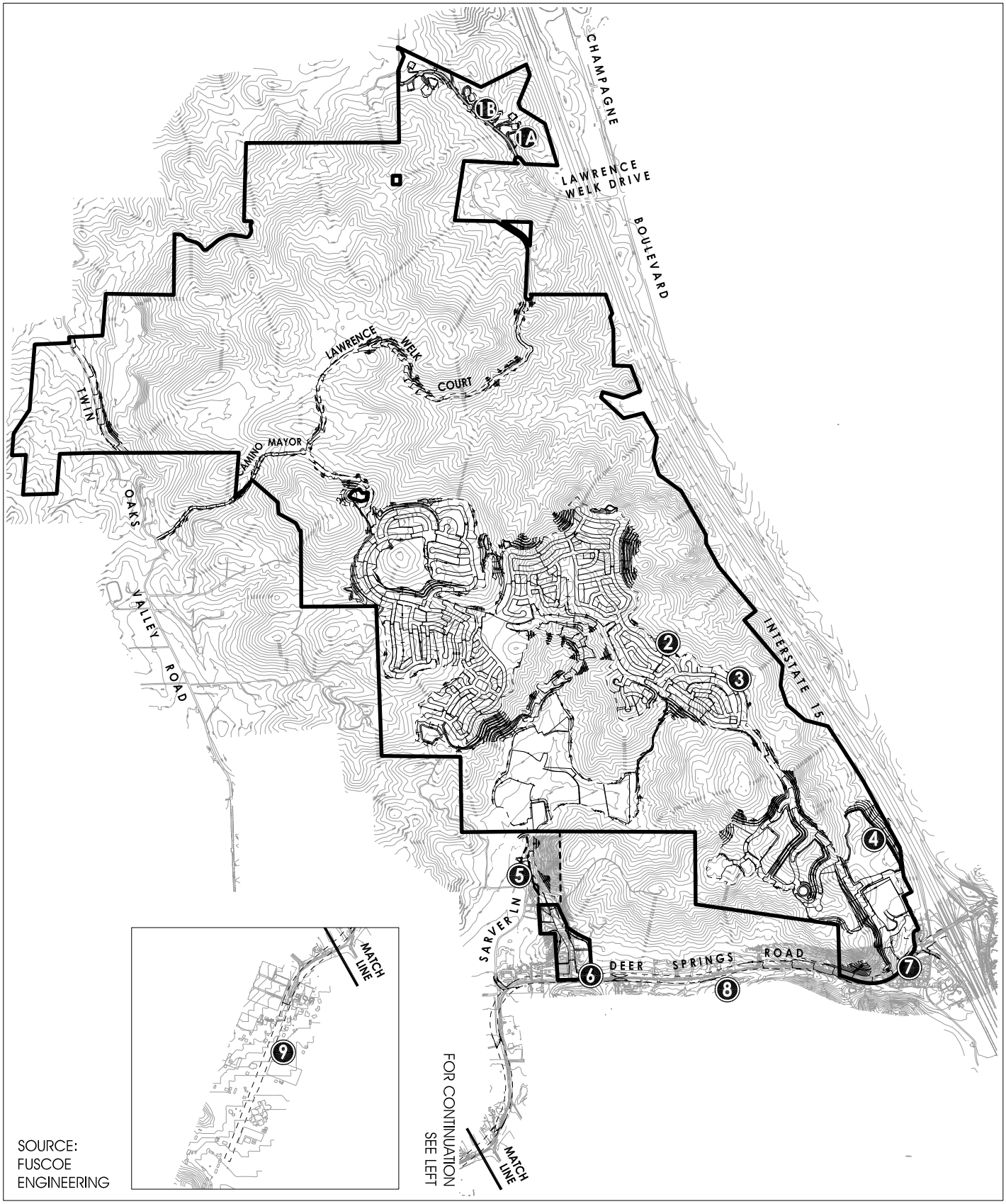
Proposed Project

FIGURE
3

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

2400 1200 0 2400
FEET

N



SOURCE:
FUSCOE
ENGINEERING

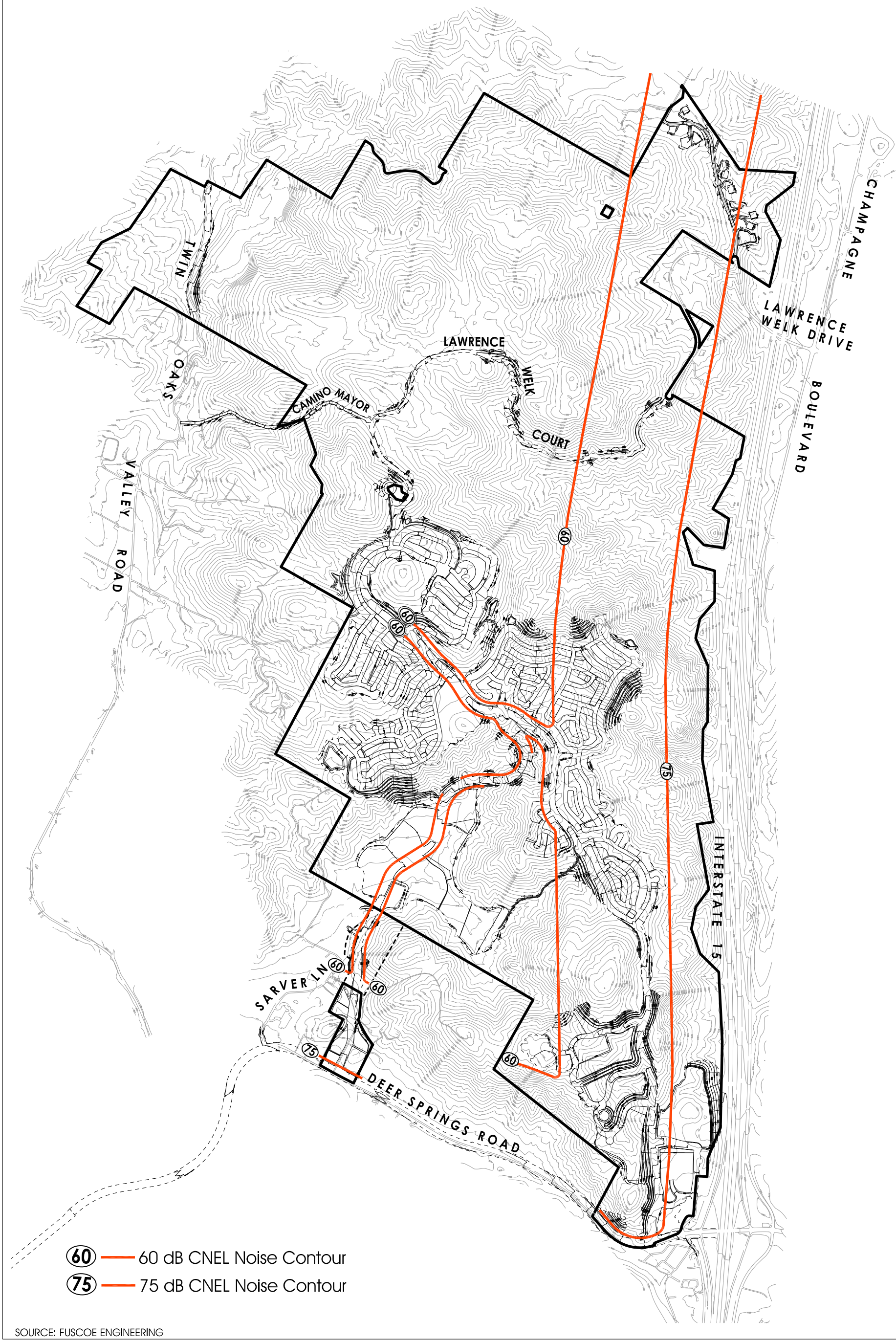
Noise Measurement Locations

FIGURE
4

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

2400 1200 0 2400
FEET

N



SOURCE: FUSCOE ENGINEERING

Worst-Case 60 & 75 dB CNEL Noise Contours

FIGURE 5

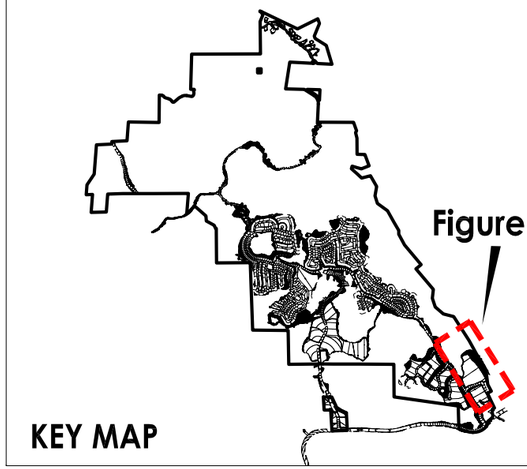
MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

1500 750 0 1500
FEET

N

60 — 60 dB CNEL Noise Contour

75 — 75 dB CNEL Noise Contour



INTERSTATE 15

TRAP. CONC. DITCH

ROCK SLOPE PROTECTION

EXIST. 60' ACCESS EASEMENT

CUDA

MESA ROCK ROAD

STREET 'A'

BASE SOURCE: FUSCOE ENGINEERING

Future 1st Floor 60 & 75 dB CNEL Noise Contours - Neighborhood 1 (N1)

FIGURE 6

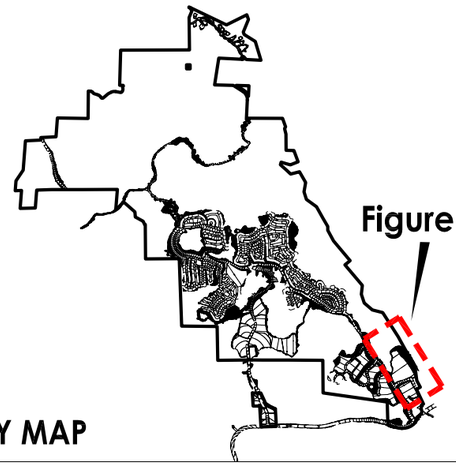
MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

200 100 0 200
FEET

N

75 2nd Floor 75 dB CNEL Noise Contour

75 3rd Floor 75 dB CNEL Noise Contour



INTERSTATE 15

TRAP CONC DITCH

ROCK SLOPE PROTECTION

EXIST. 60' ACCESS EASEMENT

CUDA

MESA ROCK ROAD

STREET 'A'

BASE SOURCE: FUSCOE ENGINEERING

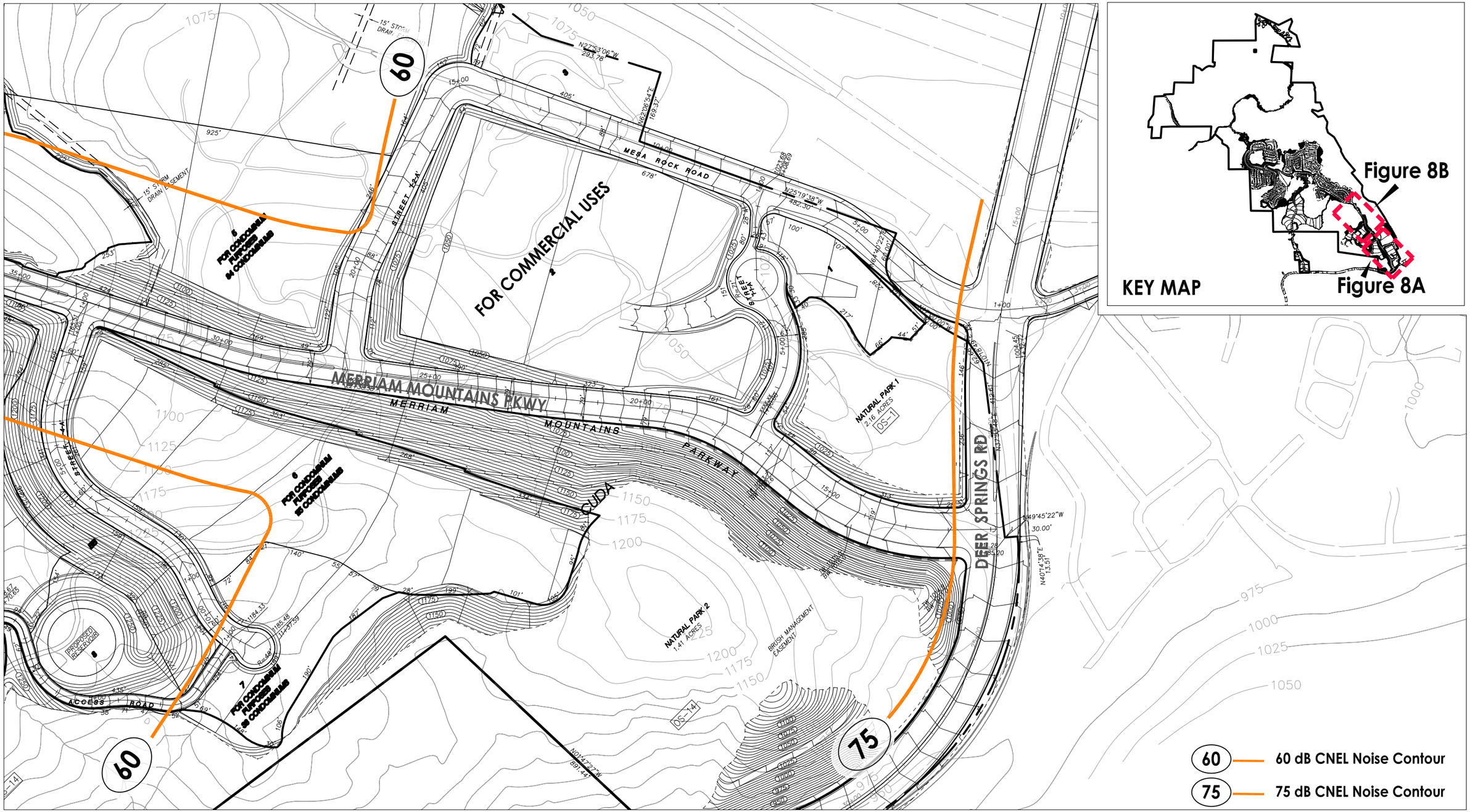
Future 2nd & 3rd Floor 75 dB CNEL Noise Contours - Neighborhood 1 (N1)

FIGURE 7

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

200 100 0 200
FEET

N



BASE SOURCE: FUSCOE ENGINEERING

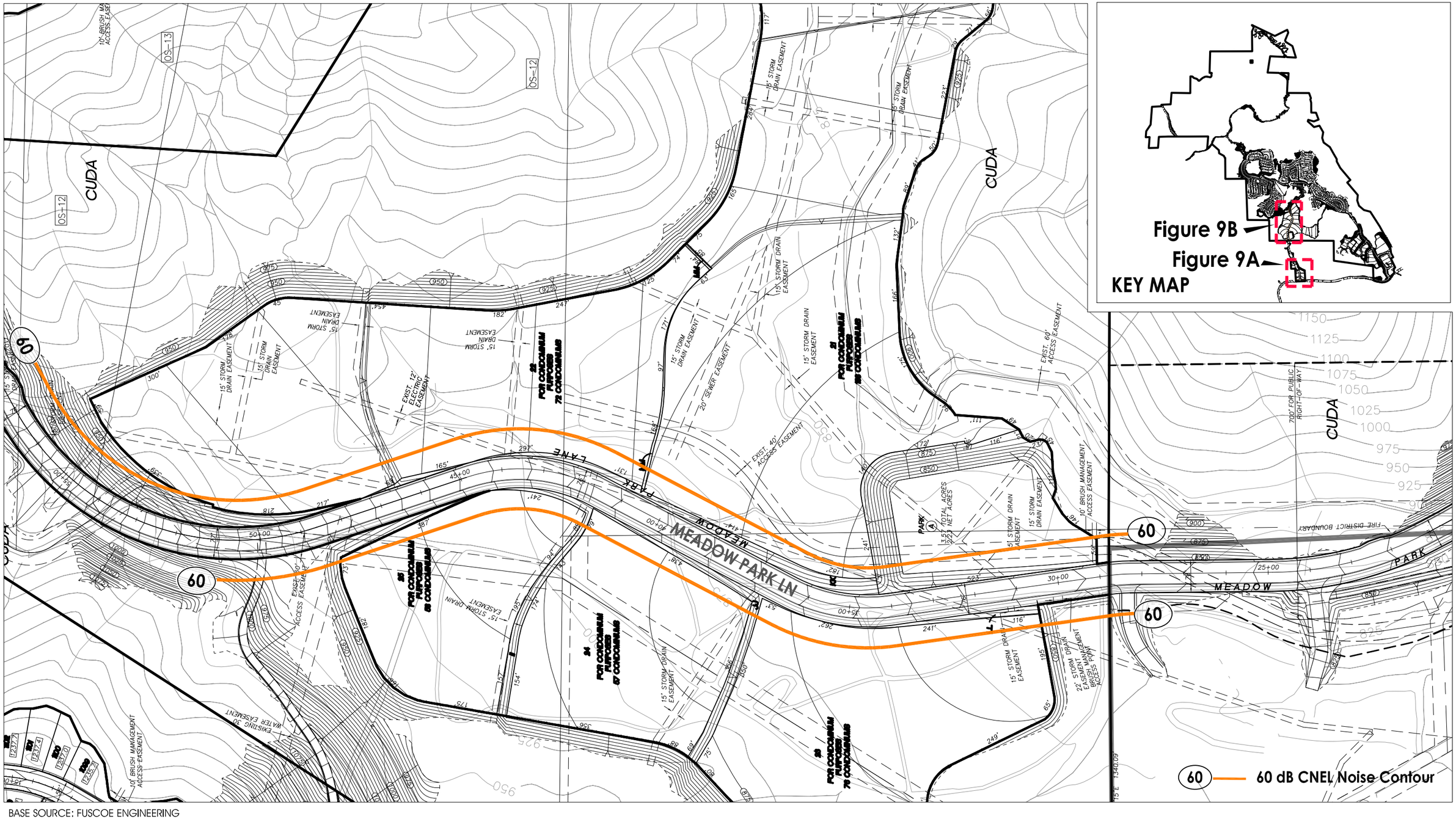
Future 60 & 75 dB CNEL Noise Contours: From Merriam Mountains Parkway & Deer Springs Road - Neighborhood 1 (N1)

FIGURE 8A

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

220 110 0 220
FEET

N



BASE SOURCE: FUSCOE ENGINEERING

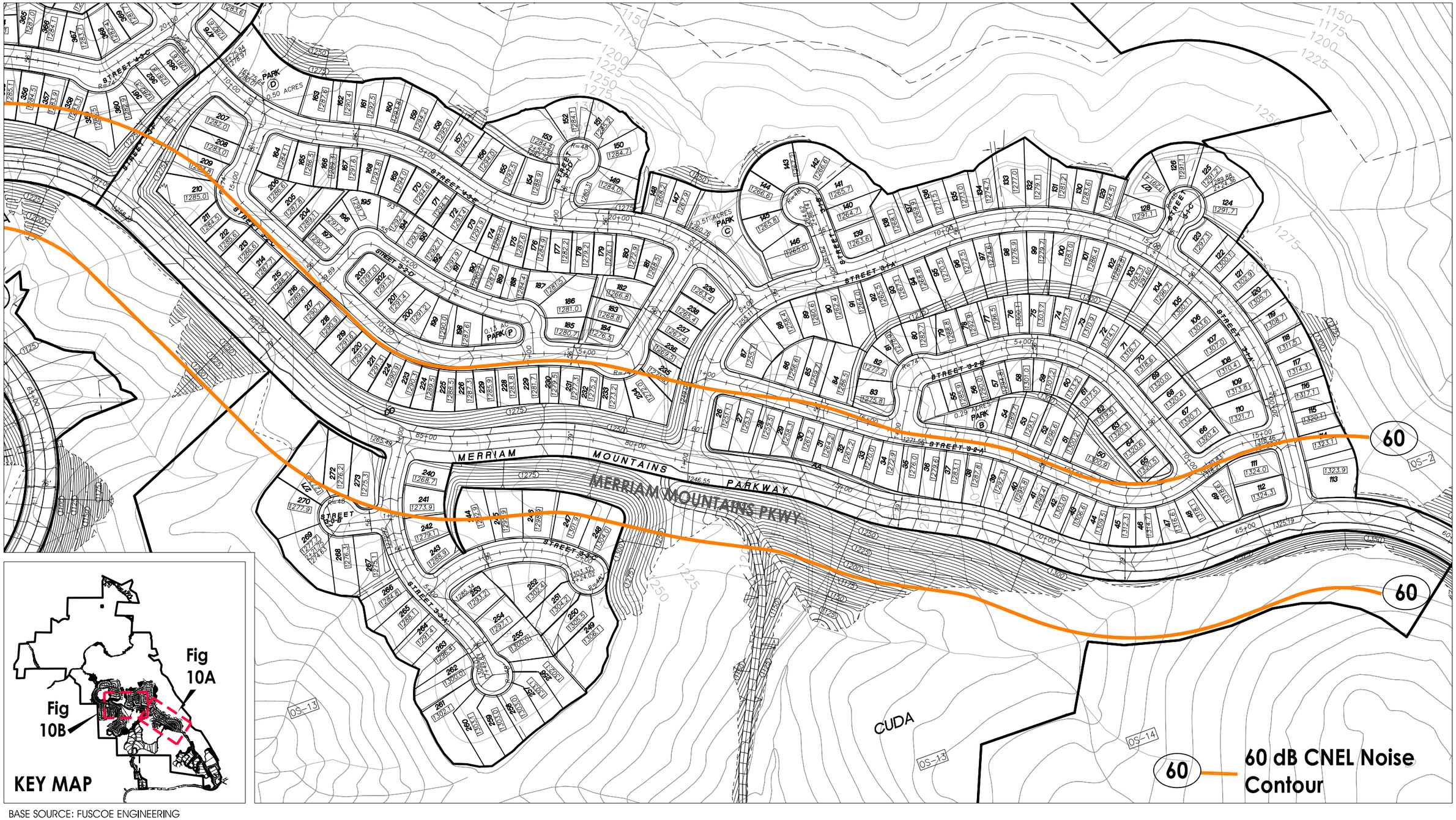
Future 60 dB CNEL Noise Contours - Neighborhood 2 (N2)

FIGURE 9B

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

220 110 0 220
FEET

N



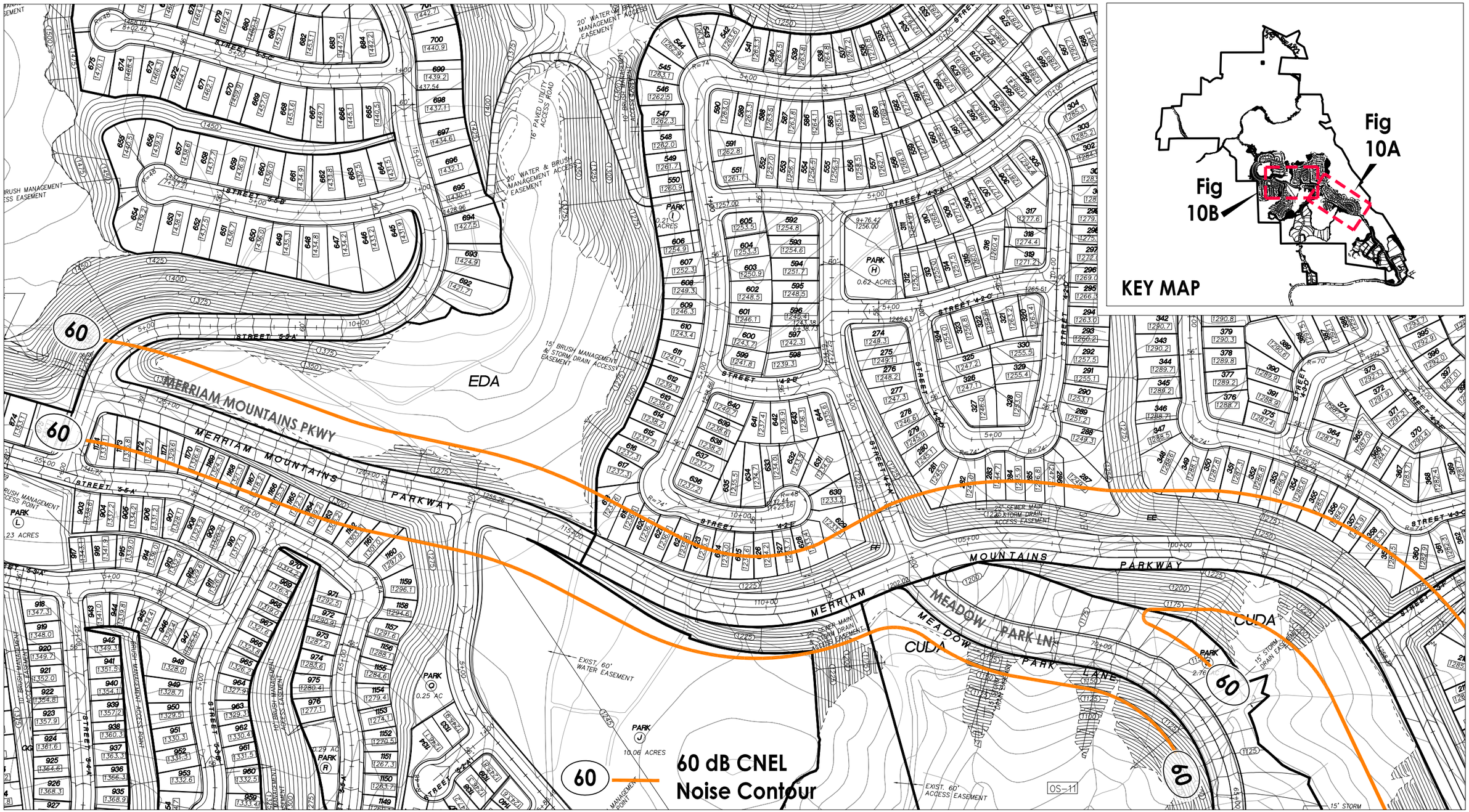
BASE SOURCE: FUSCOE ENGINEERING

Future 60 dB CNEL Noise Contours - Neighborhoods 3 & 4 (N3) (N4)

FIGURE 10A

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

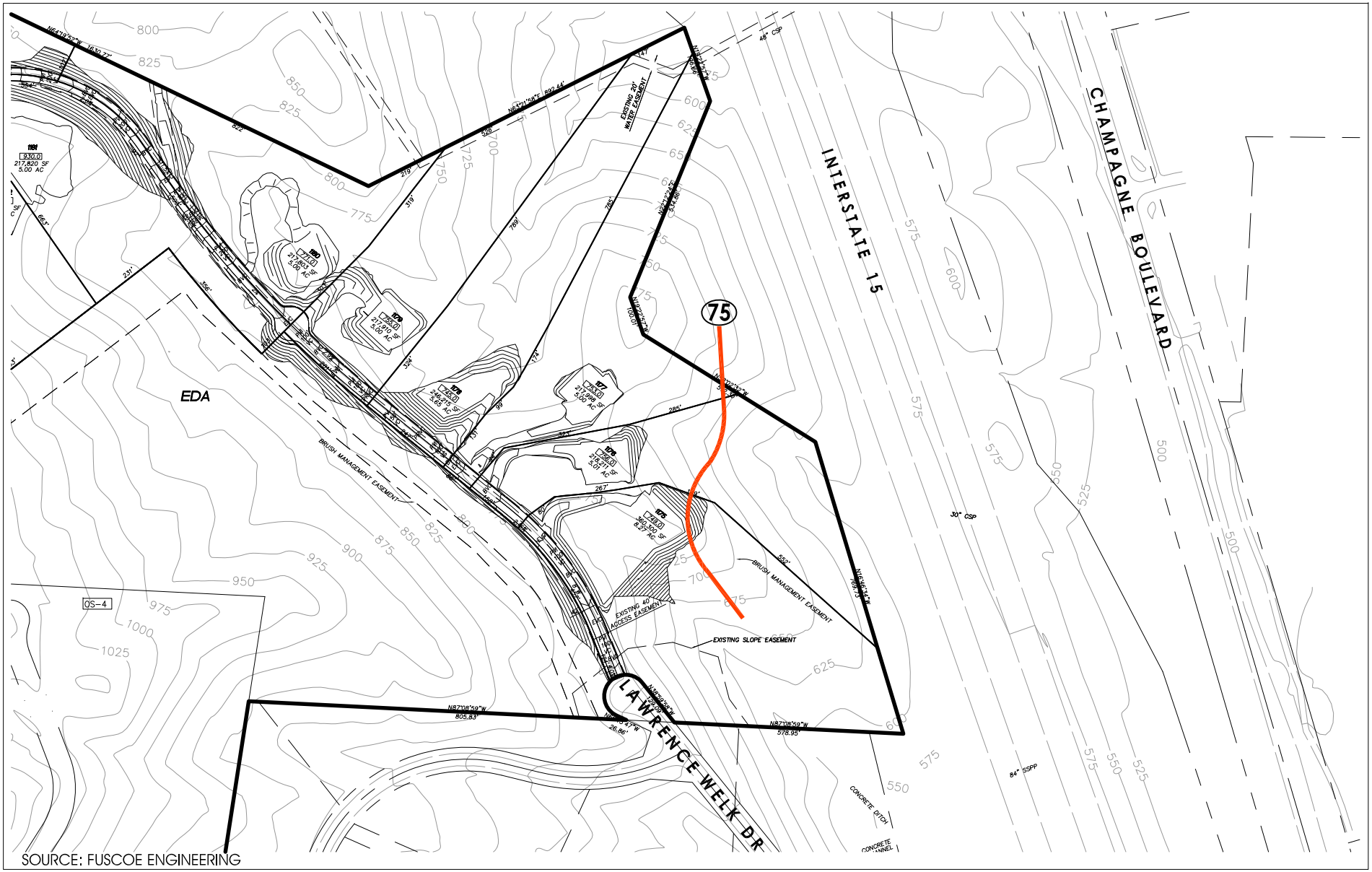
220 110 0 220
FEET



BASE SOURCE: FUSCOE ENGINEERING

Future 60 dB CNEL Noise Contours - Neighborhoods 4 & 5 (N4) (N5)

FIGURE 10B



SOURCE: FUSCOE ENGINEERING

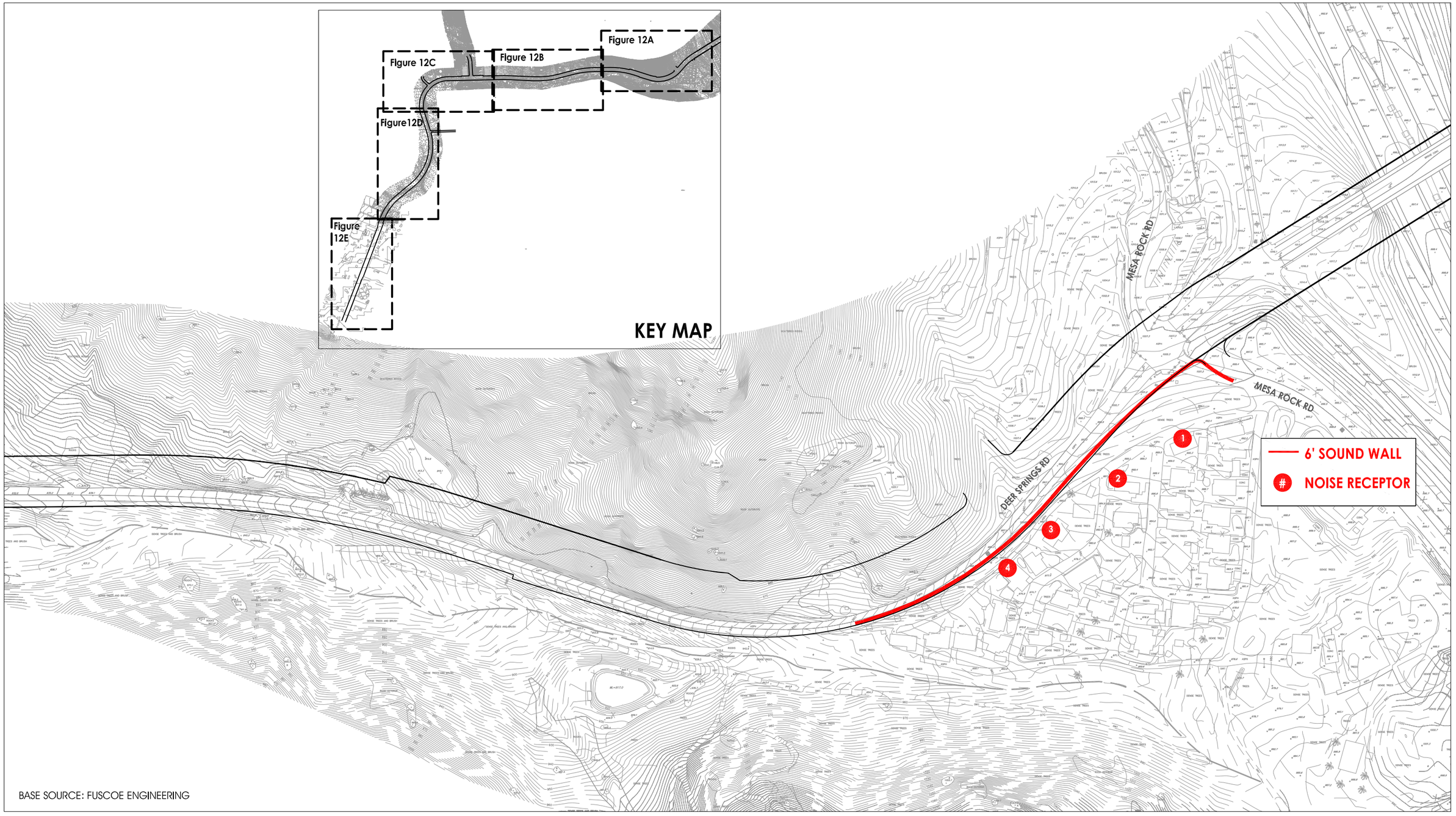
Future 1st Floor 75 dB CNEL Noise Contour at Estate Lots

FIGURE 11

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

350 175 0 350
FEET

N



Noise Receptors, Preliminary Noise Barrier Heights & Locations

FIGURE
12A

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

200 100 0 200
FEET

N

8' SOUND WALL

NOISE RECEPTOR

DEER SPRINGS RD

Figure 12A

Figure 12B

Figure 12C

Figure12D

Figure 12E

KEY MAP

BASE SOURCE: FUSCOE ENGINEERING

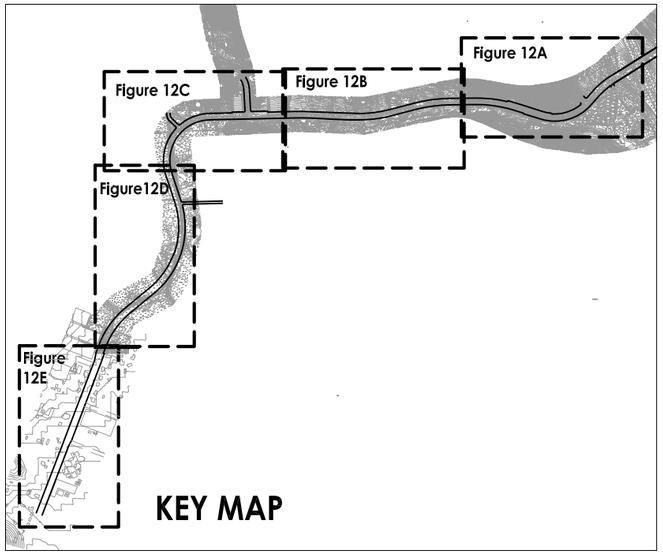
Noise Receptors, Preliminary Noise Barrier Heights & Locations

FIGURE 12B

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

200 100 0 200
FEET

N



8' SOUND WALL

NOISE RECEPTOR

13

14

16

15

DEER SPRINGS RD

SARVER LN

BASE SOURCE: FUSCOE ENGINEERING

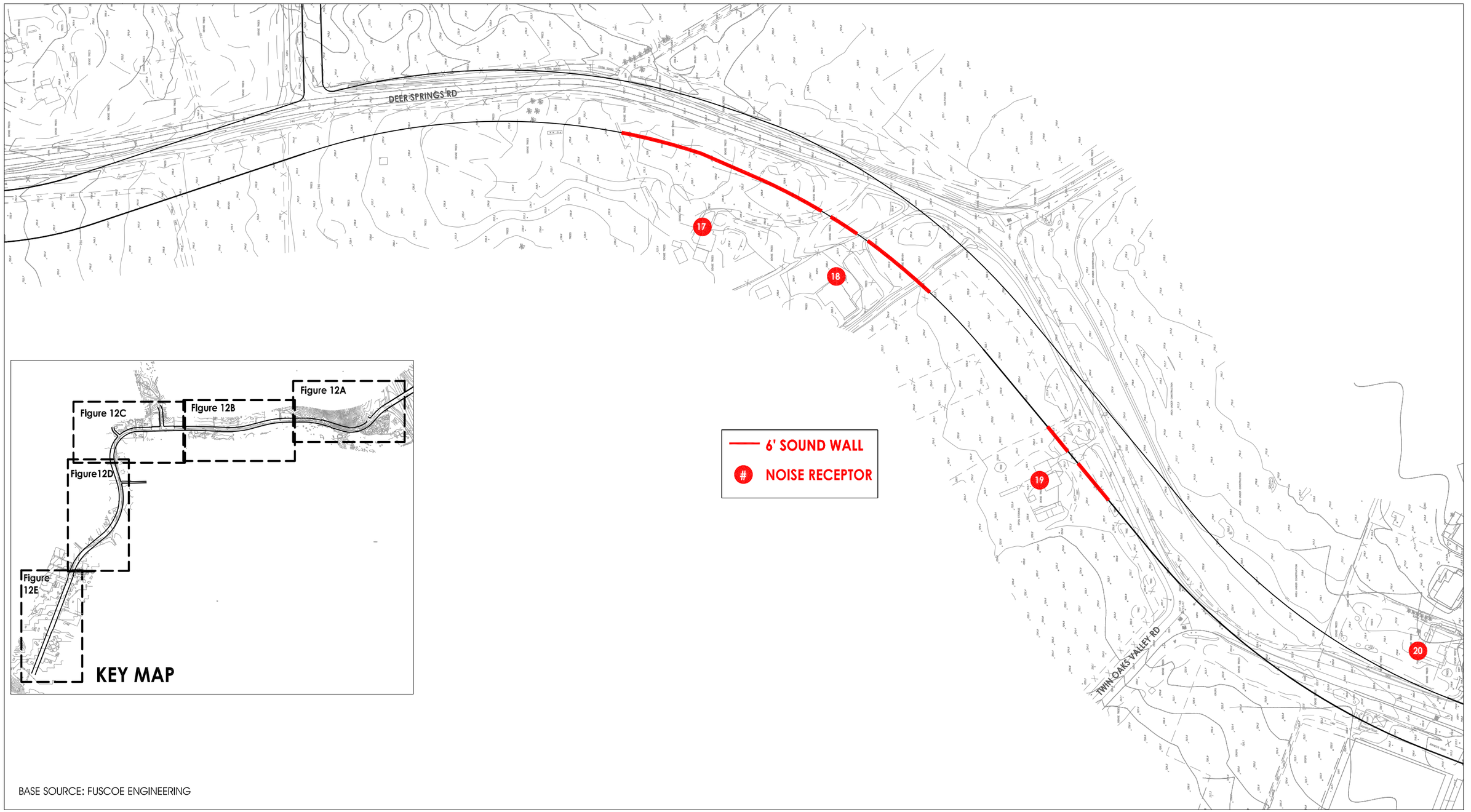
Noise Receptors, Preliminary Noise Barrier Heights & Locations

FIGURE
12C

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

200 100 0 200
FEET

N



BASE SOURCE: FUSCOE ENGINEERING

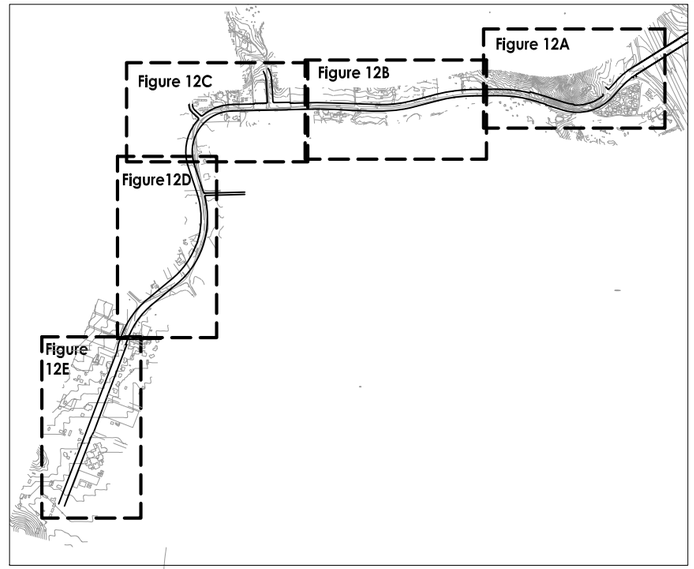
Noise Receptors, Preliminary Noise Barrier Heights & Locations

FIGURE 12D

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

200 100 0 200
FEET

N



KEY MAP

BUENA CREEK RD
OLIVE ST
CASSOU RD

BASE SOURCE: FUSCOE ENGINEERING

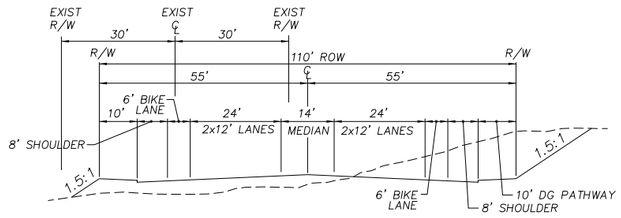
Noise Receptor Locations

FIGURE
12E

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

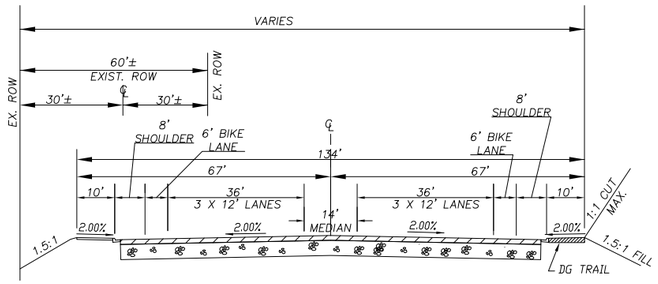
200 100 0 200
FEET

N



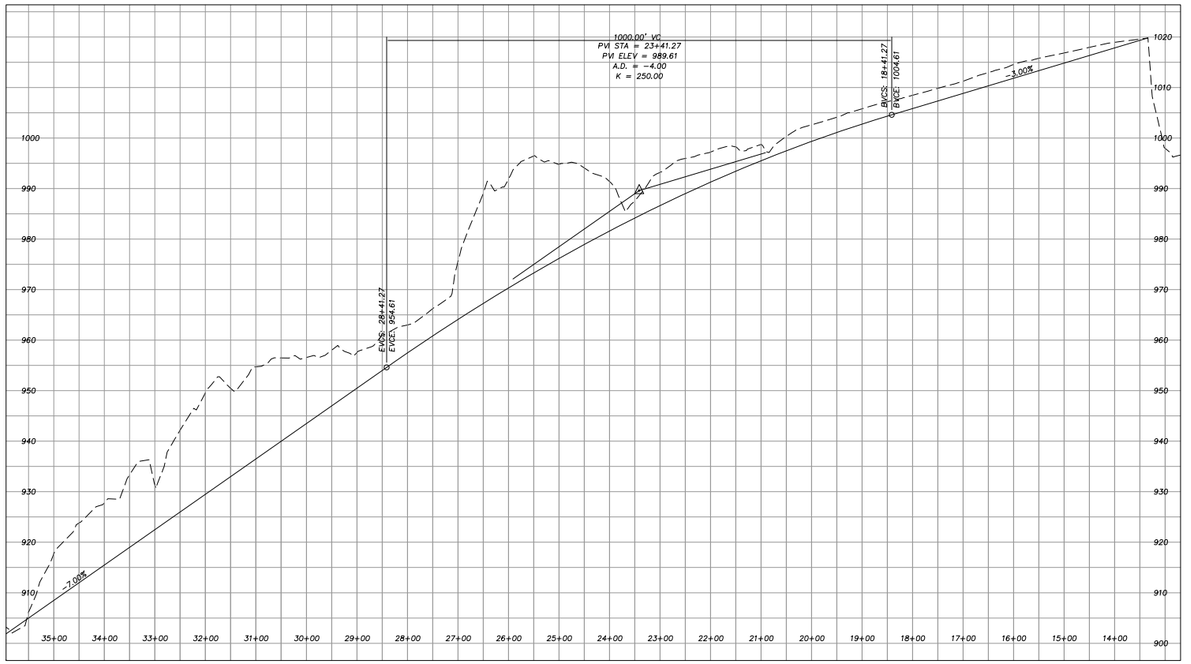
TYPICAL 4-LANE SECTION - DEER SPRINGS ROAD

NOT TO SCALE

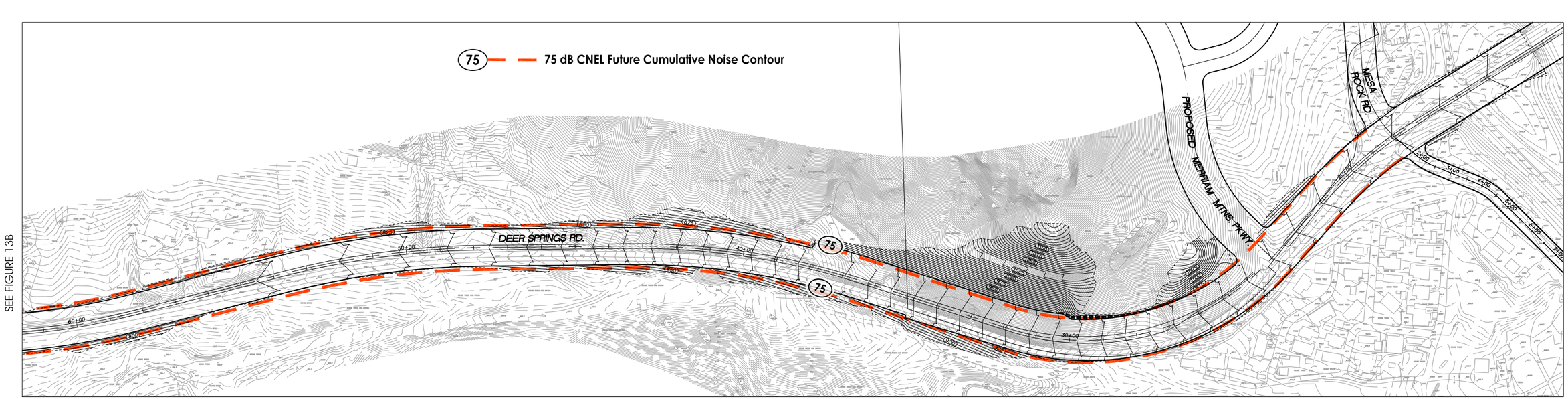


TYPICAL 6-LANE SECTION - DEER SPRINGS ROAD

NOT TO SCALE



PROFILE - DEER SPRINGS ROAD HORIZ. SCALE: 1" = 150' VERT. SCALE: 1" = 15'



DEER SPRINGS ROAD - PLAN VIEW

BASE SOURCE: FUSCOE ENGINEERING

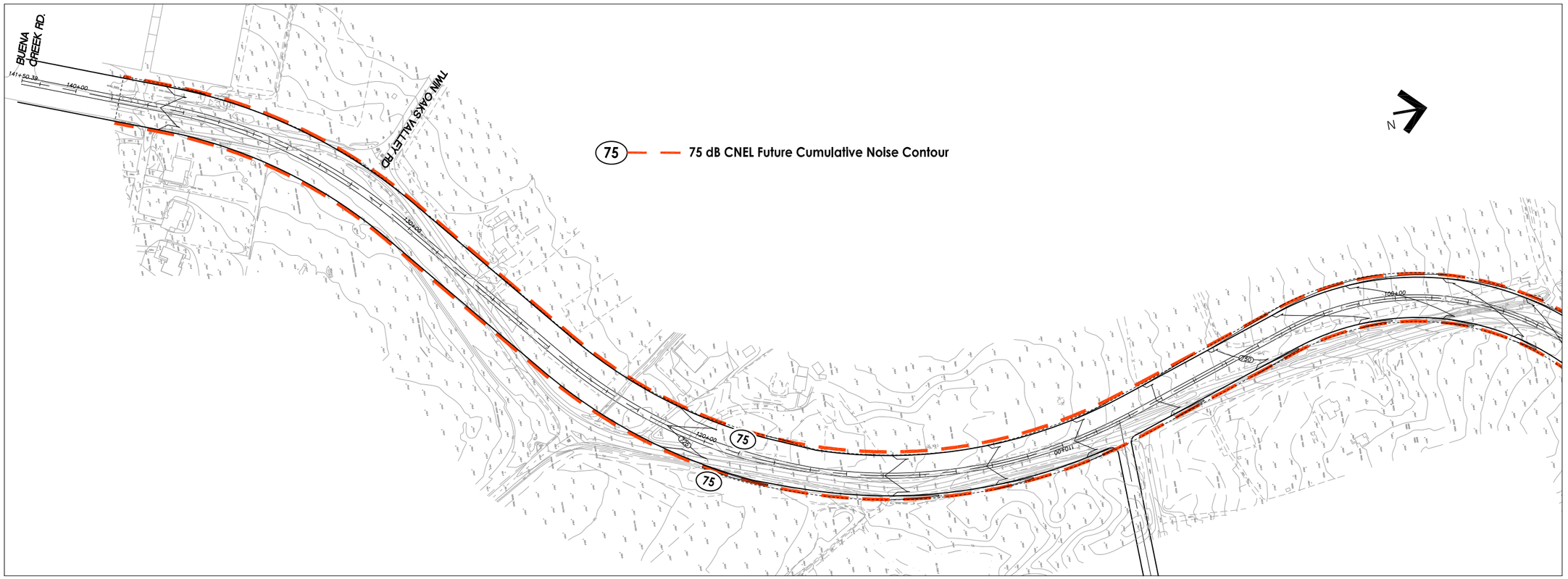
Future (Existing + Project + Cumulative Projects) 75 dB CNEL Noise Contours

FIGURE 13A

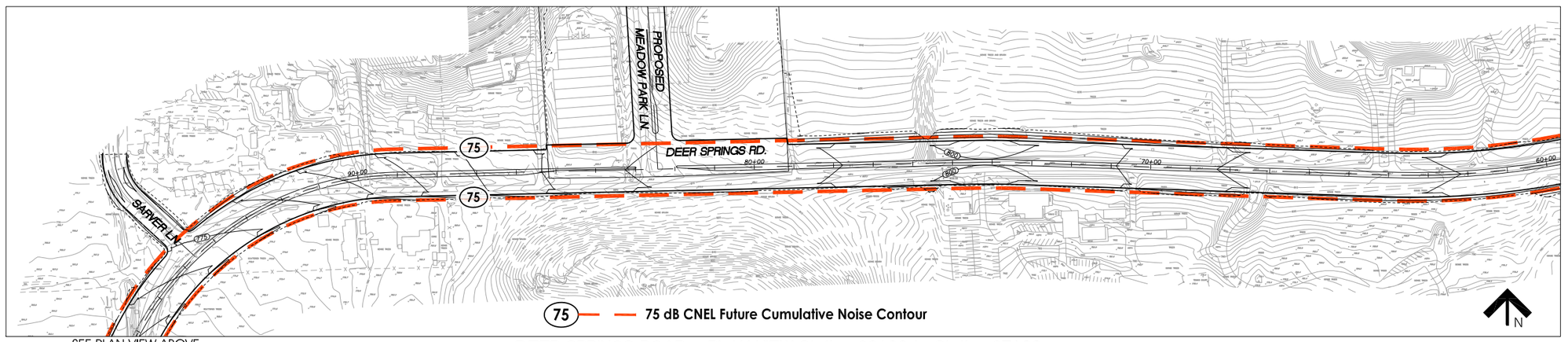
MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

300 150 0 300
FEET

N



DEER SPRINGS ROAD – PLAN VIEW Station 97+00 to Station 139+00



DEER SPRINGS ROAD – PLAN VIEW Station 60+00 to Station 97+00

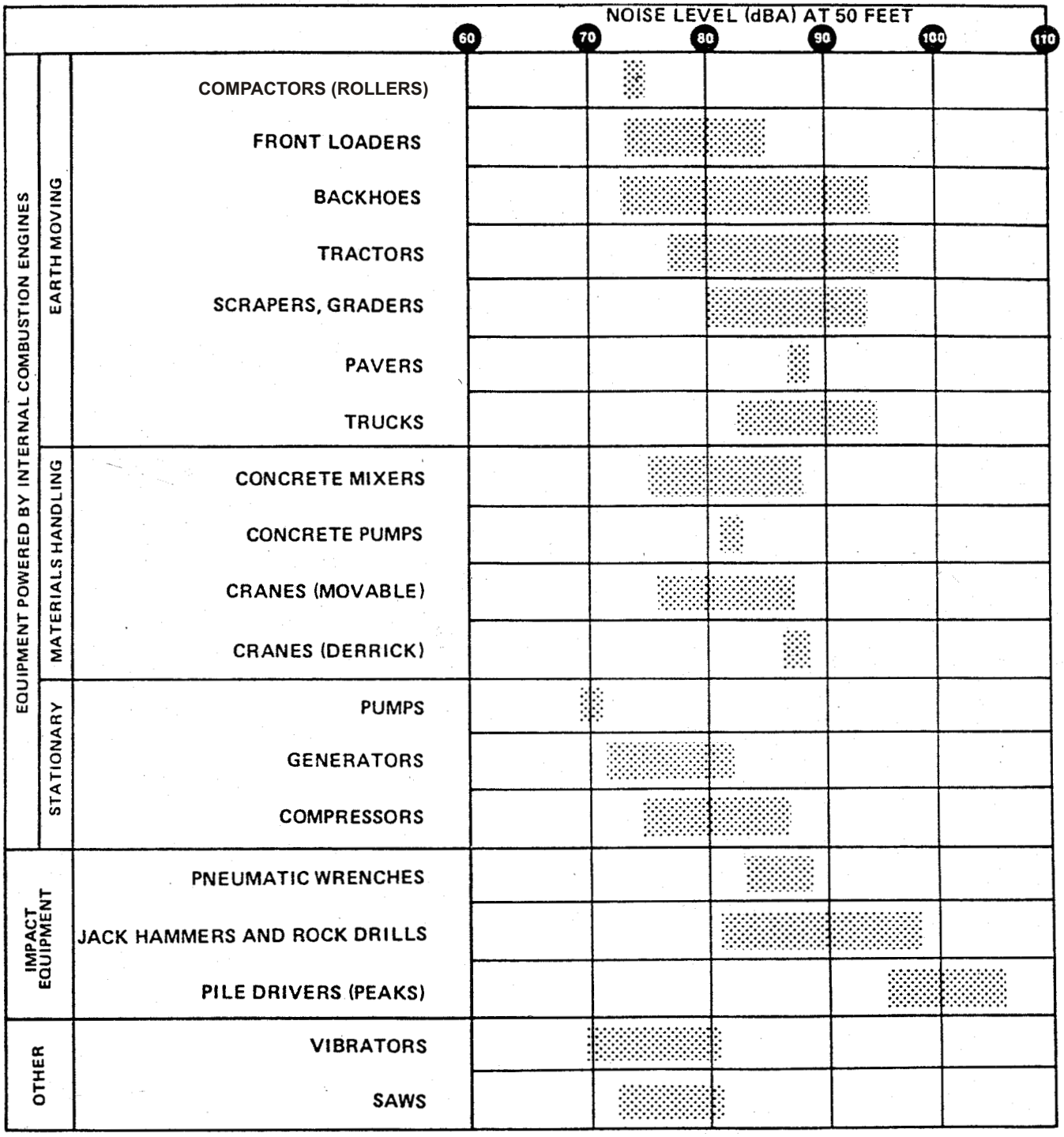
BASE SOURCE: FUSCOE ENGINEERING

Future (Existing + Project + Cumulative Projects) 75 dB CNEL Noise Contours

FIGURE 13B

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

300 150 0 300
FEET

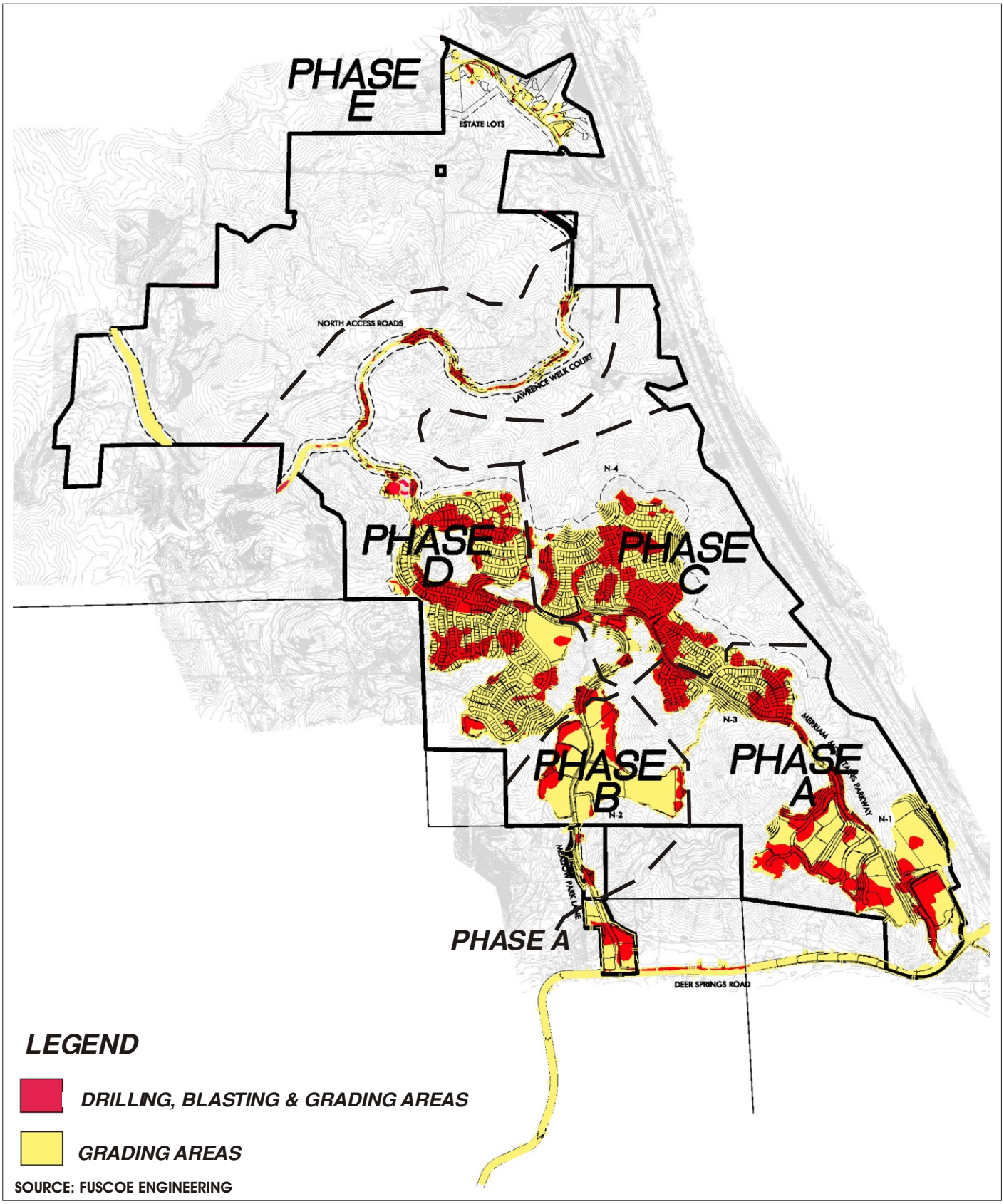


SOURCE: EPA PB 206717, Environmental Protection Agency, Dec. 31, 1971, "Noise from Construction Equipment & Operations"

Typical Construction-Equipment Noise Levels

FIGURE 14

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

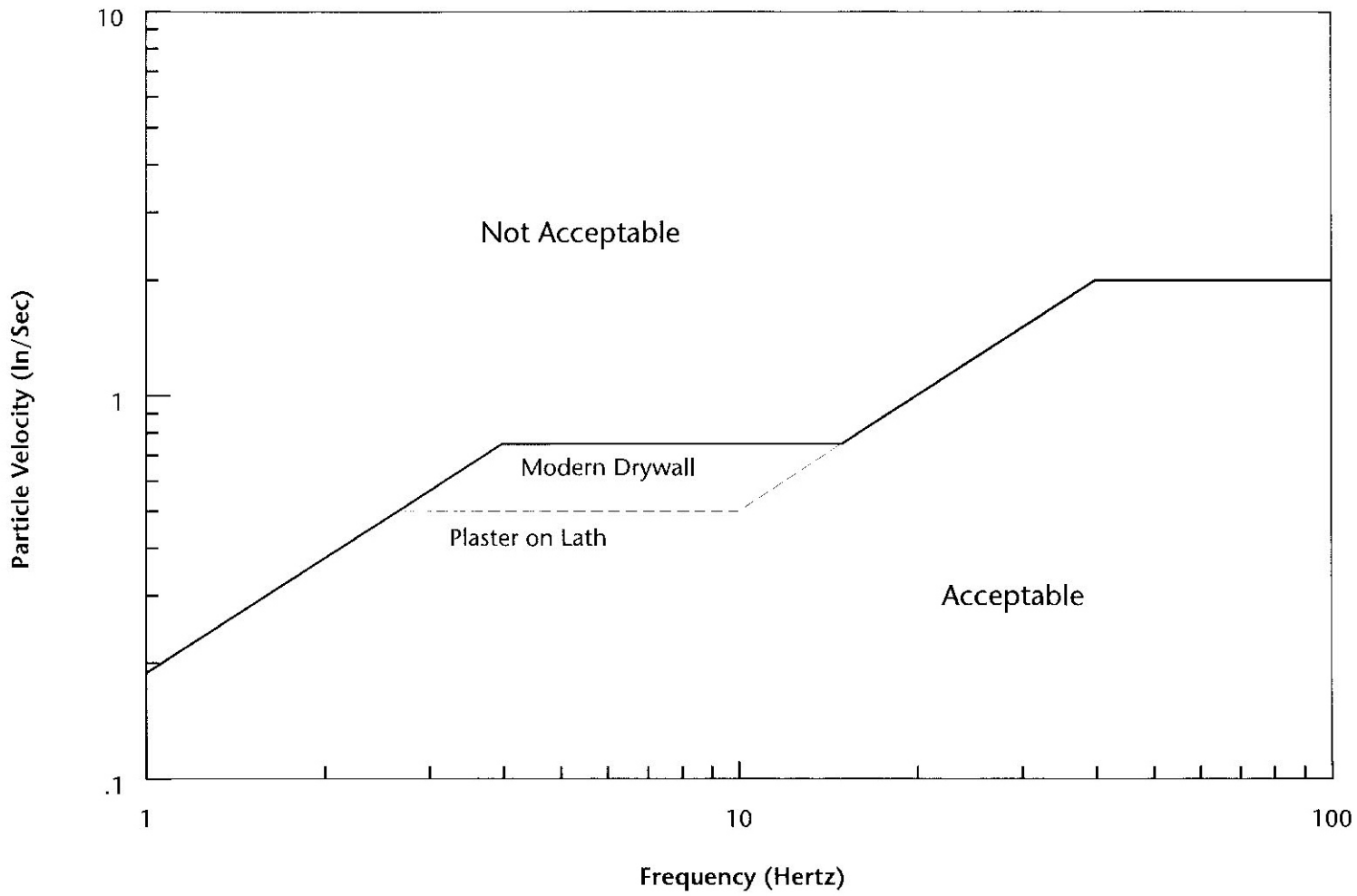


Grading, Drilling, & Blasting Phasing

FIGURE 15

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

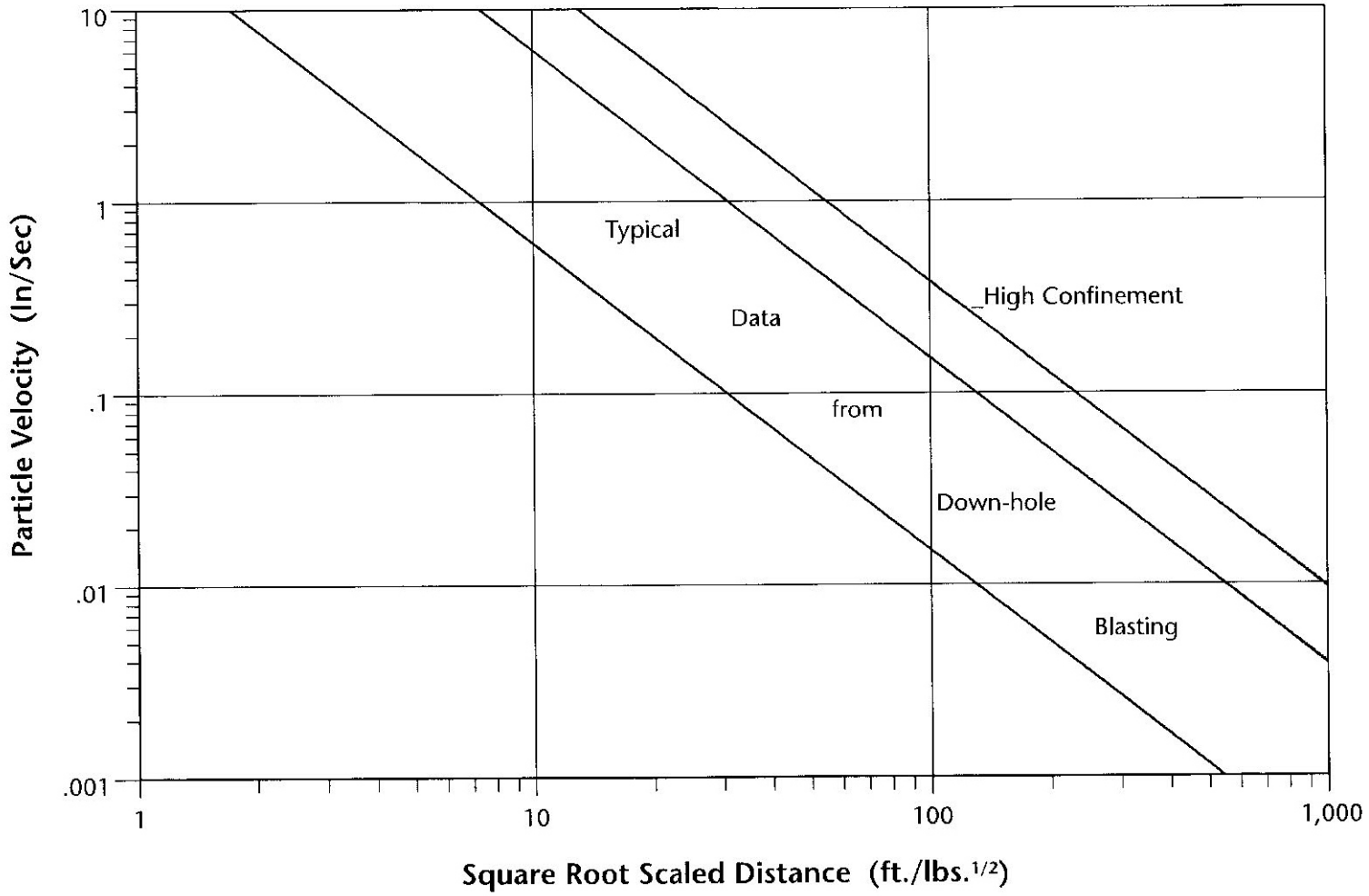
N



Source: U.S. Bureau of Mines

RI8507 Alternative Blasting Level Criteria

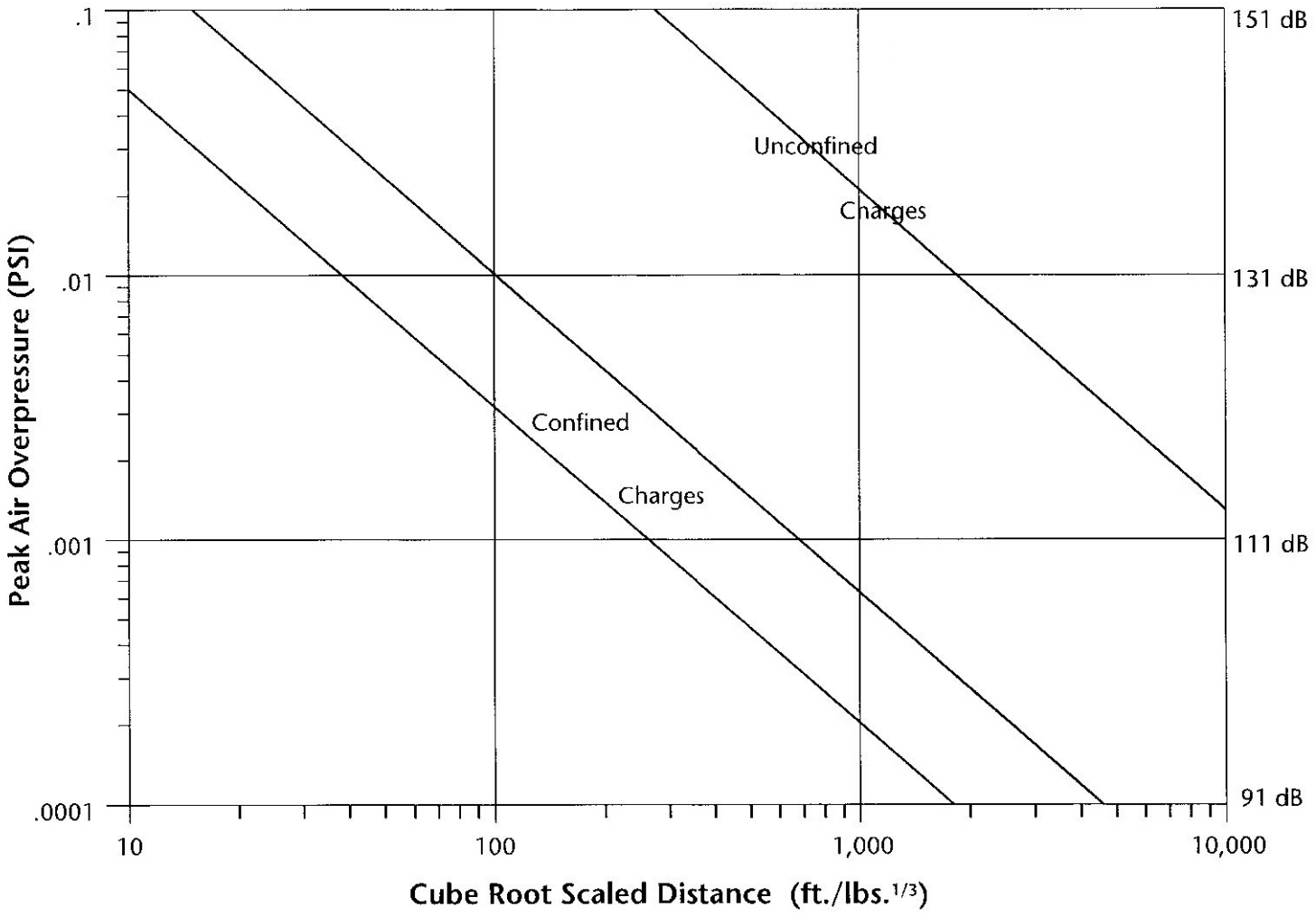
FIGURE 16



Source: Jones & Stokes

Blast Vibration Prediction Curves

FIGURE 17

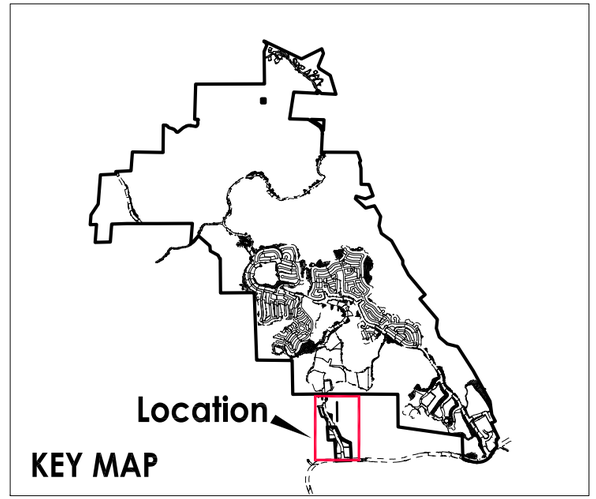


Source: Jones & Stokes

Blast Air Overpressure Prediction Curves

FIGURE 18

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT



Blasting Area

Residence Locations

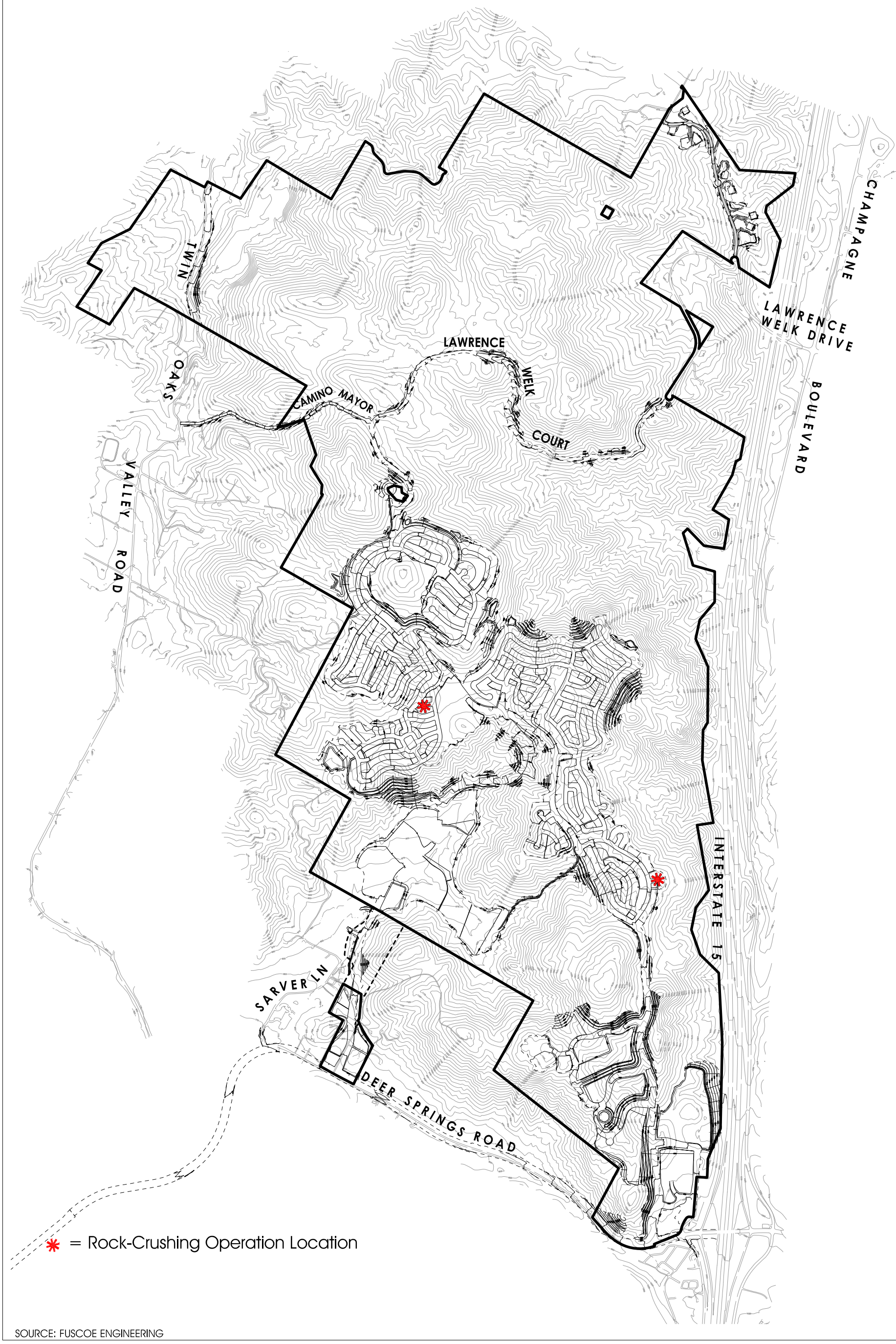
BASE SOURCE: FUSCOE ENGINEERING

Off-Site Residences near Blasting Area

FIGURE
19

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

300 150 0 300
FEET



SOURCE: FUSCOE ENGINEERING

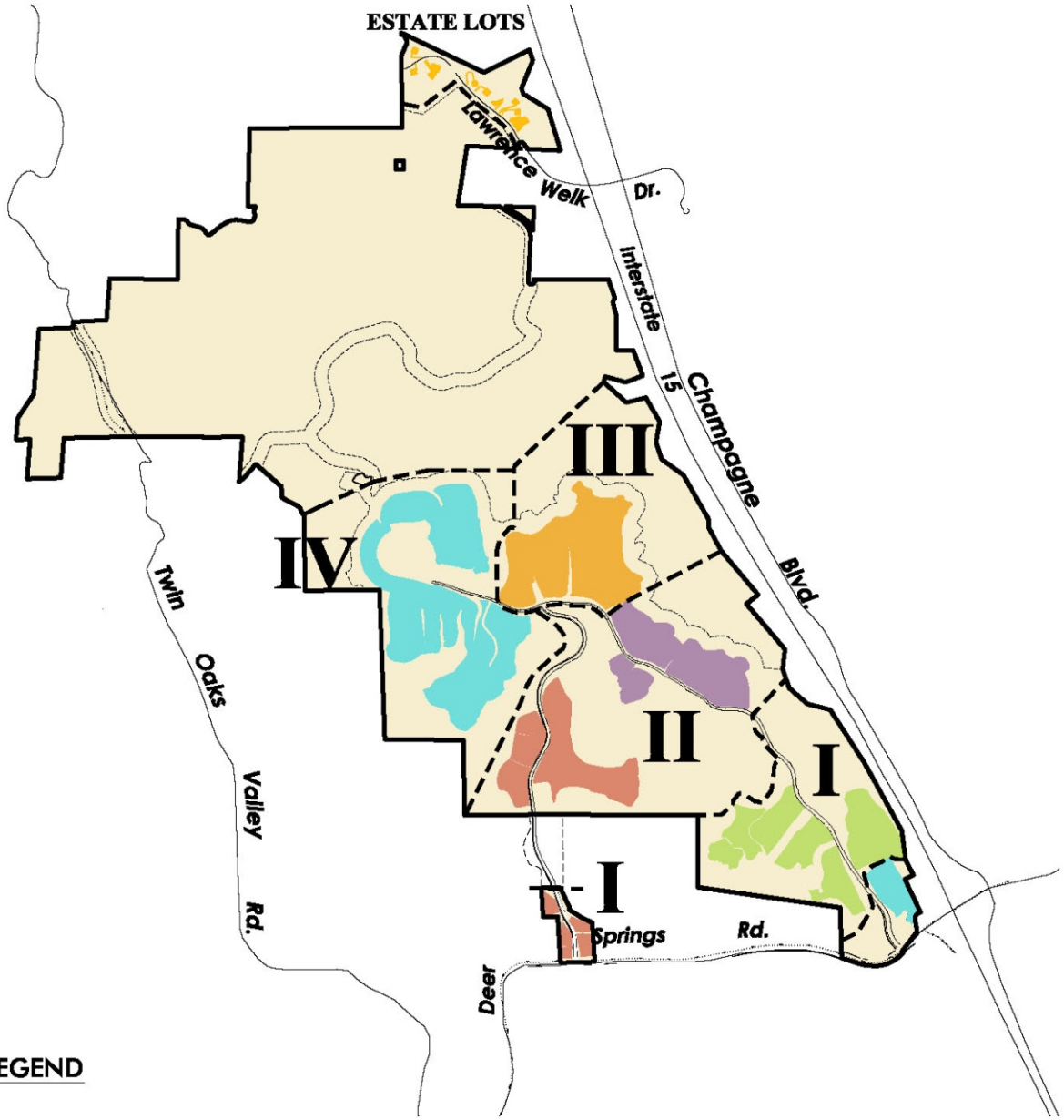
Locations of Rock-Crushing Operations

FIGURE 20

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

1500 750 0 1500
FEET

N



LEGEND

PHASE I	Apartments (270 DU's), Variable Residential (820 DU's)
PHASE II	Single Family (248 DU's), Variable Residential (451 DU's)
PHASE III	Single Family (371 DU's)
PHASE IV	Single Family (530 DU's), Neighborhood Commercial
ESTATE LOTS	Estate Residential (10 DU's)

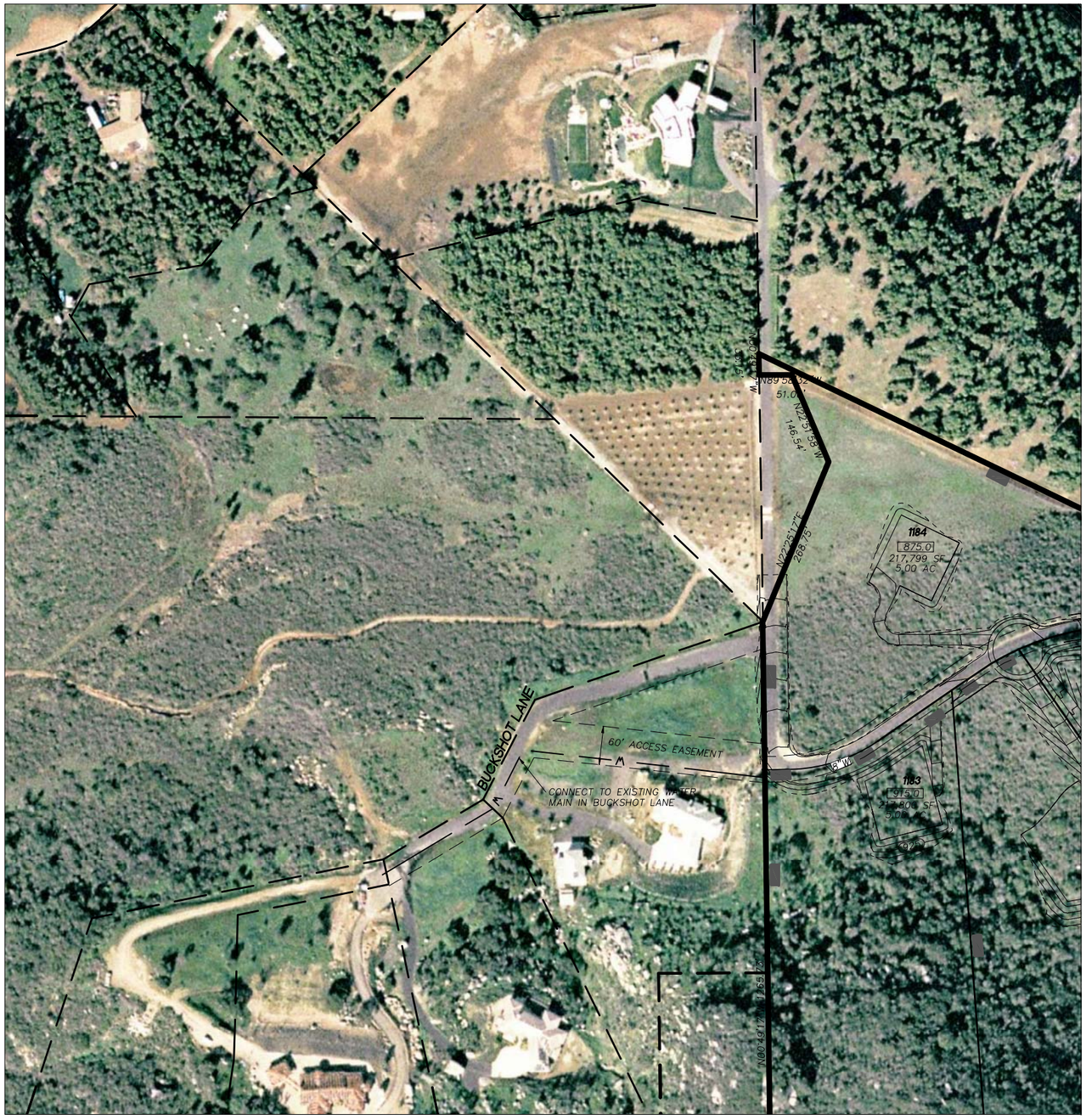
NOT TO SCALE

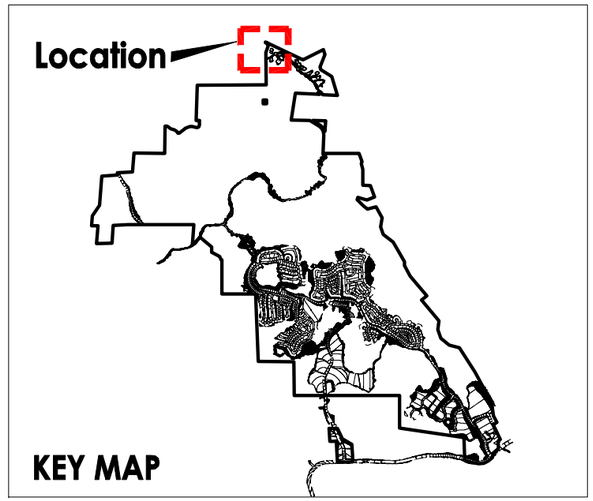
SOURCE: FUSCOE ENGINEERING

Project Development Phasing

FIGURE 21

N





BASE SOURCE: FUSCOE ENGINEERING

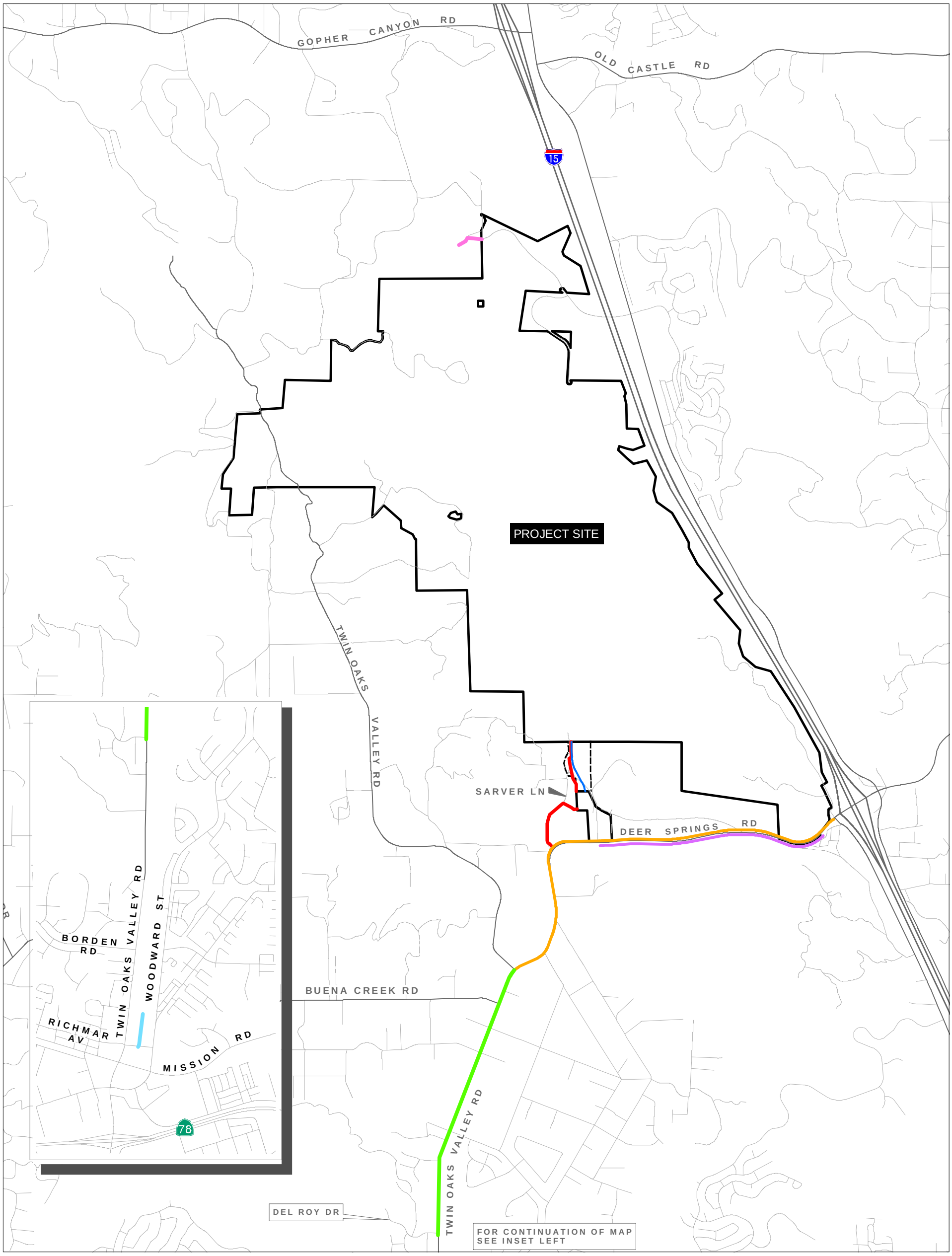
Off-Site Residences adjacent to Off-Site Water Line

FIGURE
22A

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

200 100 0 200
FEET

N



Legend

- Project Site
- Off-Site Easement Access

Off-Site Water & Sewer Items:

- Item 1. Water extension in Buckshot Lane to existing main.
- Item 2. Off-site water in Deer Springs Road (located within identified limits of grading for off-site improvements)
- Item 3. Off-site water in Meadow Park Lane
- Item 4. Off-site sewer in Sarver Lane & Meadow Park Lane.
- Item 5. Off-site sewer in Twin Oaks Valley Road from Del Roy Drive to Deer Springs Road.
- Item 6. Off-site sewer in Deer Springs Road (located within identified limits of grading for off-site improvements)
- Item 7. Off-site sewer upsizing from existing 18-Inch line to 21-Inch line.

Off-Site Water & Sewer Lines

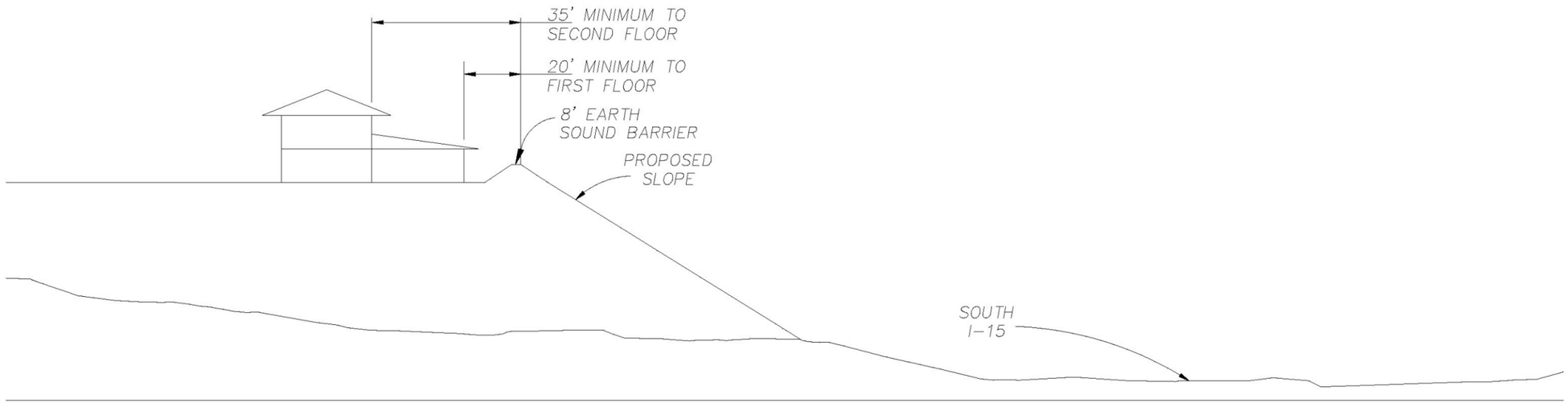
FIGURE 22B

MERRIAM MOUNTAINS SPECIFIC PLAN ACOUSTICAL ASSESSMENT REPORT

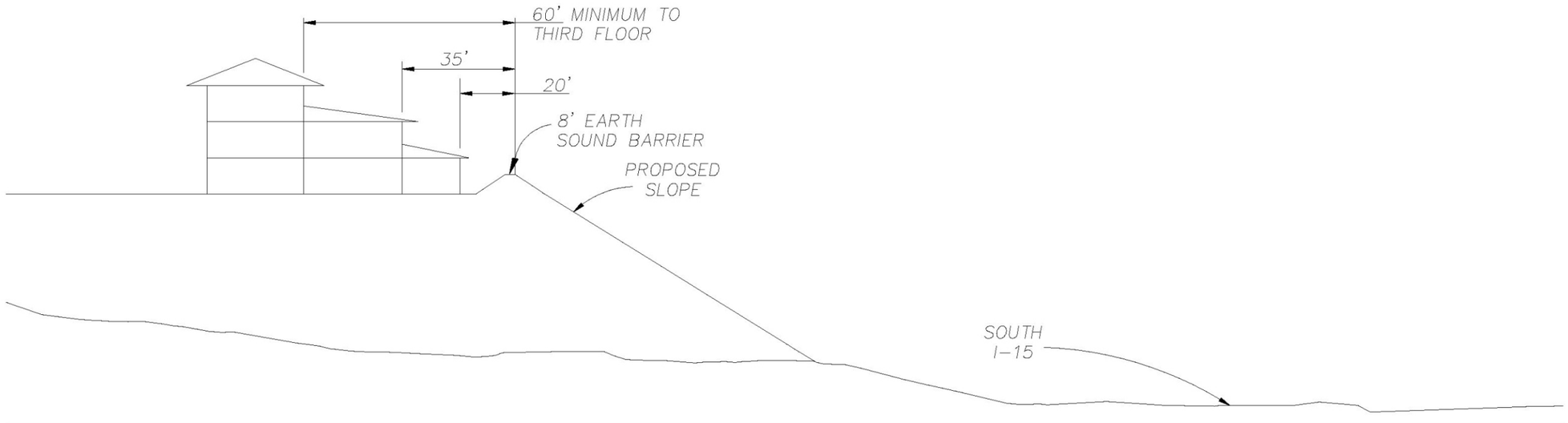
0 1,250 2,500 5,000

Feet

N



2 Story, Section A-A
Neighborhood 1, Planning Area 2



3 Story, Section A-A
Neighborhood 1, Planning Area 2

D1-Designator Noise Setback Standard

Second- and Third-Floor Building Setback Distances - Neighborhood 1, Planning Area 2

FIGURE
23

N

16
FOR CONDOMINIUM
PURPOSES
18 CONDOMINIUMS

18
FOR CONDOMINIUM
PURPOSES
14 CONDOMINIUMS

17
FOR CONDOMINIUM
PURPOSES
8 CONDOMINIUMS

15
FOR CONDOMINIUM
PURPOSES
19 CONDOMINIUMS

6'
6'
6'
8'
8'

Location
KEY MAP

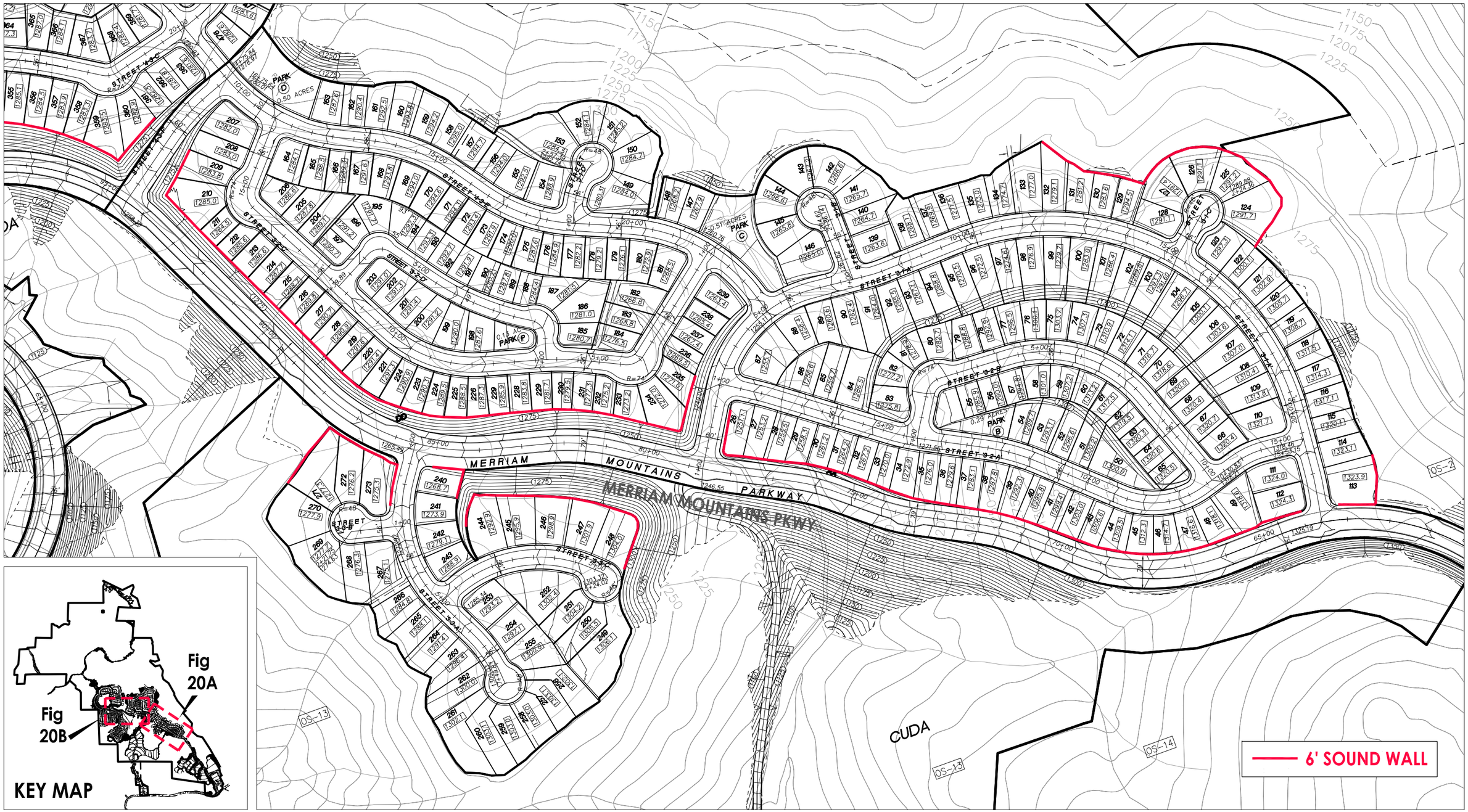
BASE SOURCE: FUSCOE ENGINEERING

Noise Barrier Heights & Locations - Neighborhood 2 (N2)

FIGURE
24

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

100 50 0 100
FEET



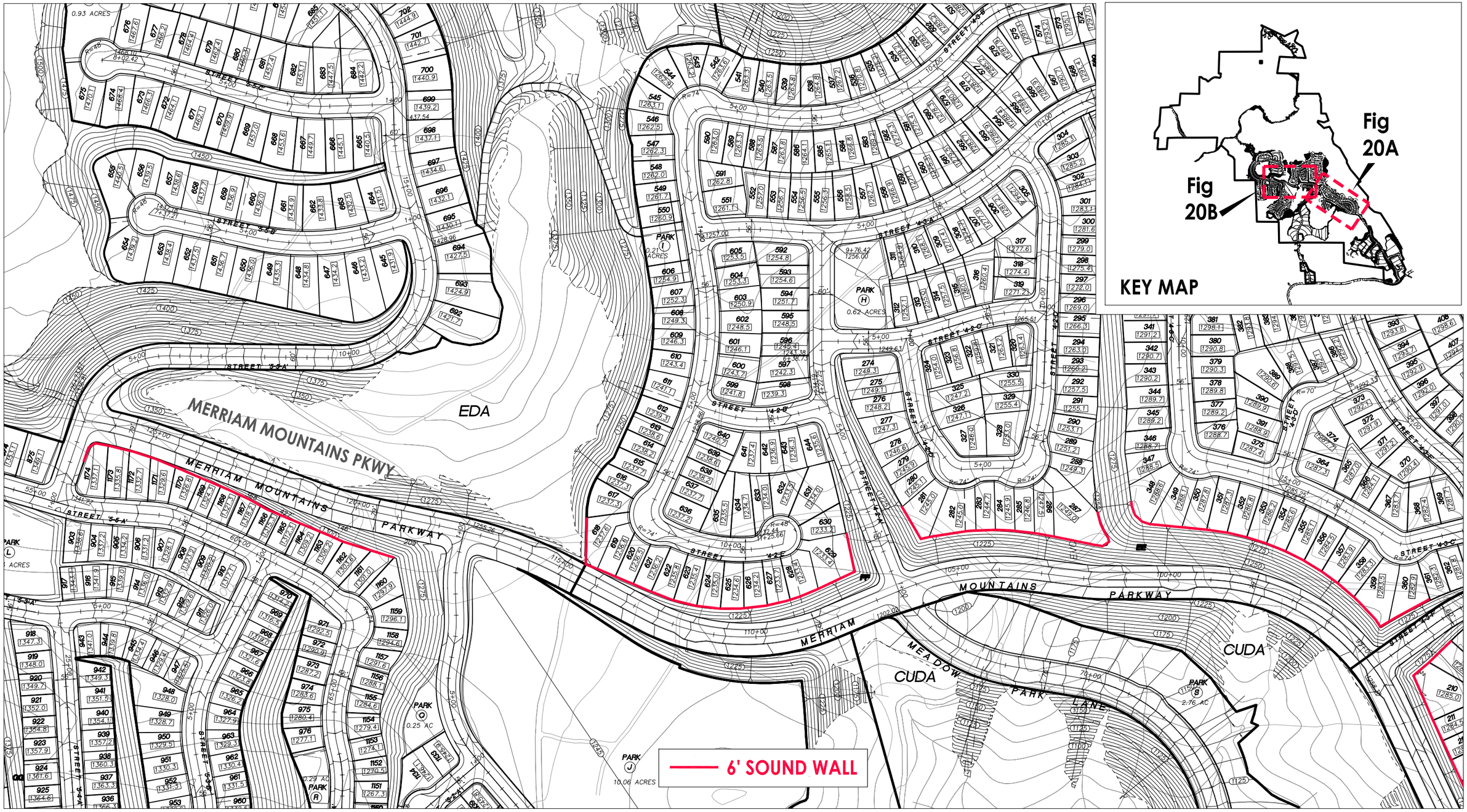
BASE SOURCE: FUSCOE ENGINEERING

Noise Barrier Heights & Locations - Neighborhoods 3 & 4 (N3) (N4)

FIGURE 25A

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

220 110 0 220
FEET



BASE SOURCE: FUSCOE ENGINEERING

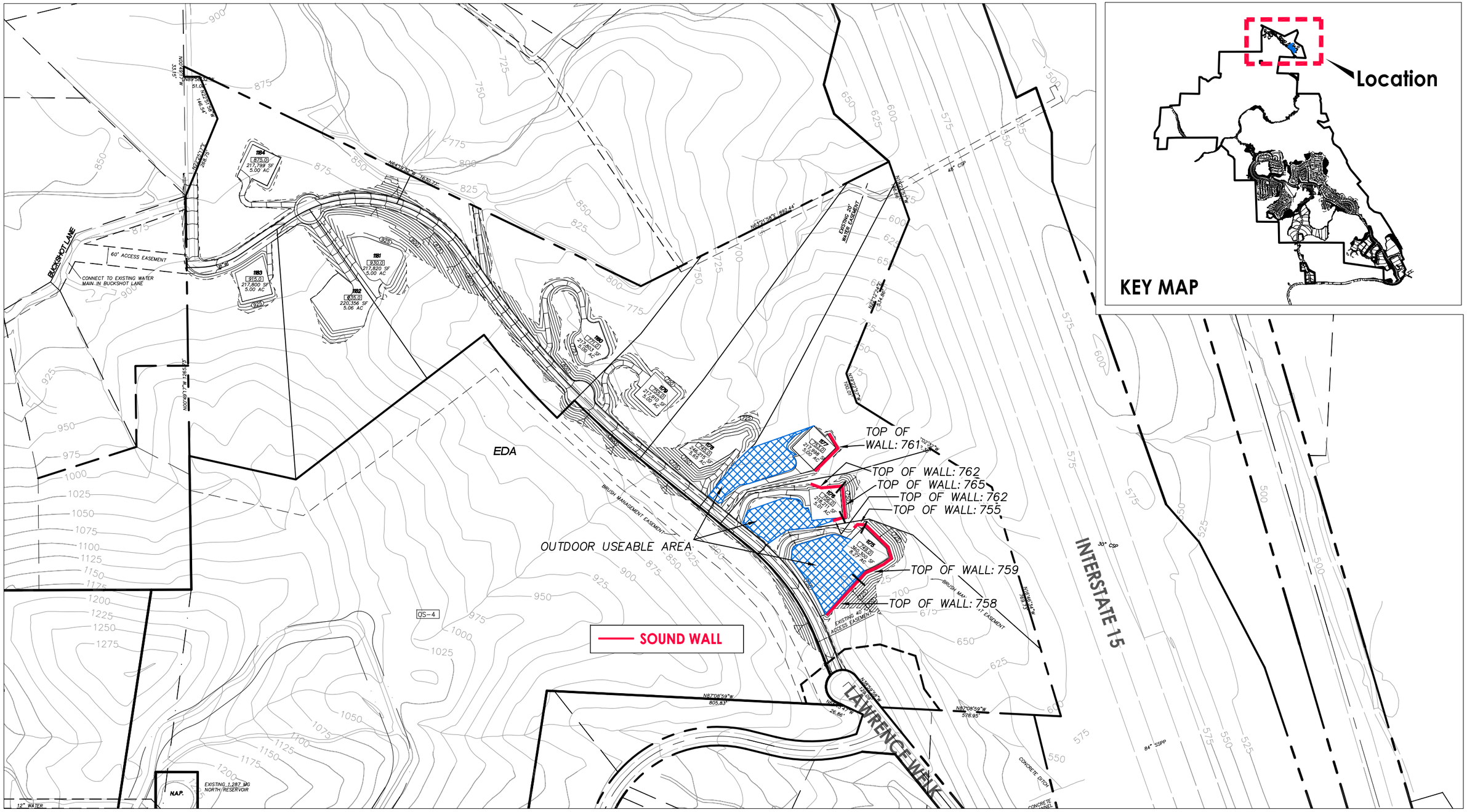
Noise Barrier Heights & Locations - Neighborhoods 4 & 5 (N4) (N5)

FIGURE 25B

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

220 110 0 220
FEET

N



BASE SOURCE: FUSCOE ENGINEERING

Noise Barrier Heights & Locations - Estate Lots

FIGURE 26

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

300 150 0 300
FEET

N

PROPOSED MERRIAM MTNS. PKWY.

MESA ROCK RD.

DEER SPRINGS RD

EXISTING RIGHT-OF-WAY

2+00
3+00
4+00
5+00
6+00
7+00
7+19.21
20+00
30+00

KEY MAP

Location

Temporary 12' Noise Barrier

BASE SOURCE: FUSCOE ENGINEERING

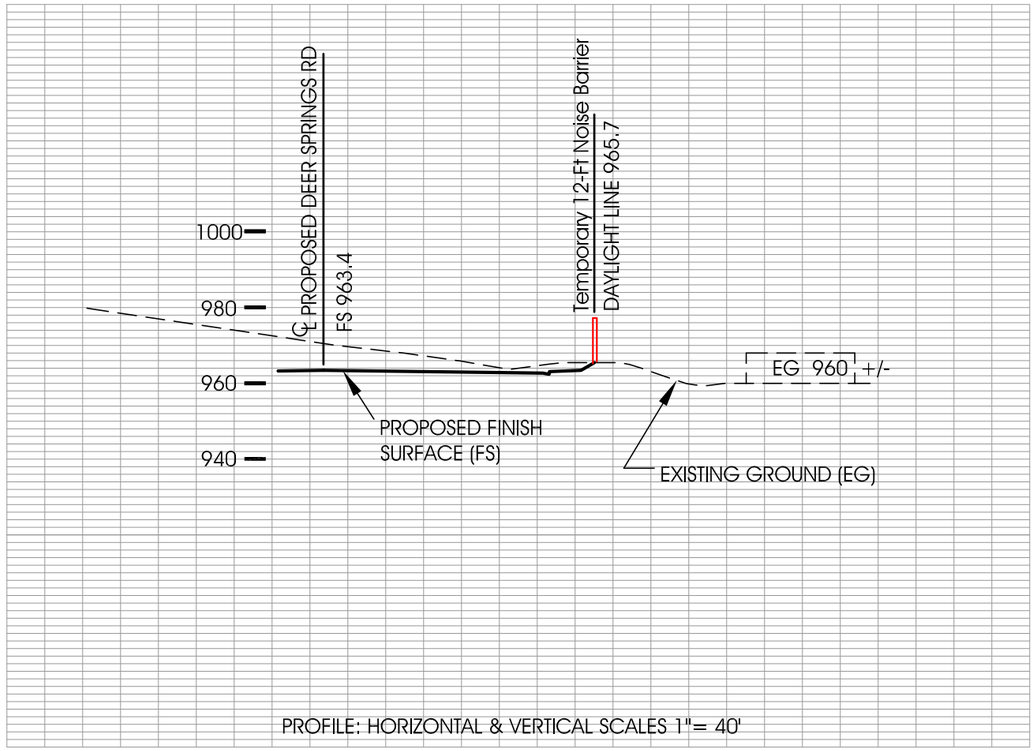
Preliminary Temporary Noise Barrier Height & Location

FIGURE
27

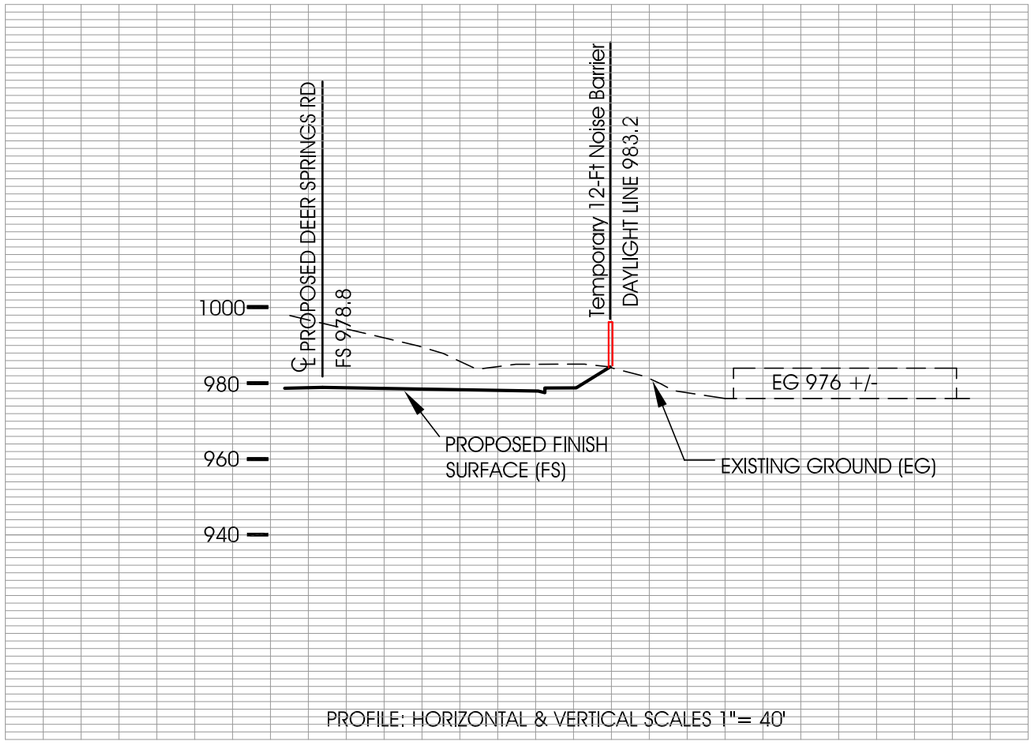
MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

160 80 0 160
FEET

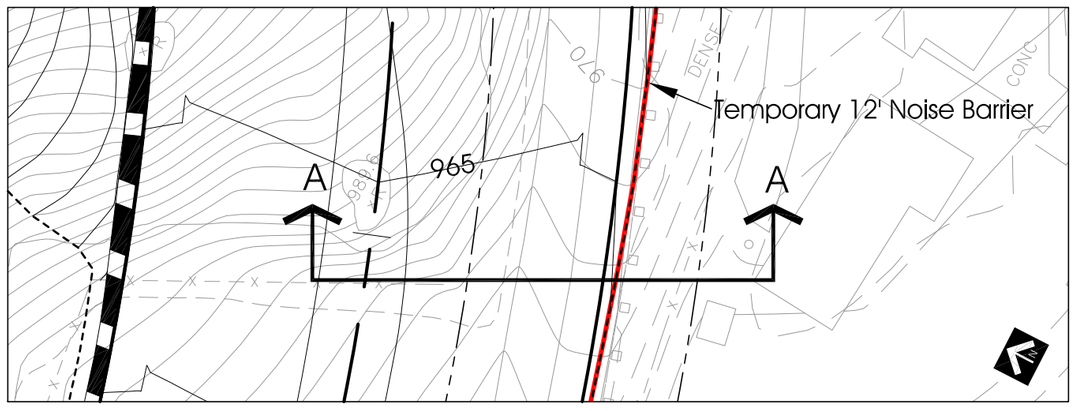
N



PROFILE: HORIZONTAL & VERTICAL SCALES 1"= 40'



PROFILE: HORIZONTAL & VERTICAL SCALES 1"= 40'



SECTION A-A

SECTION B-B

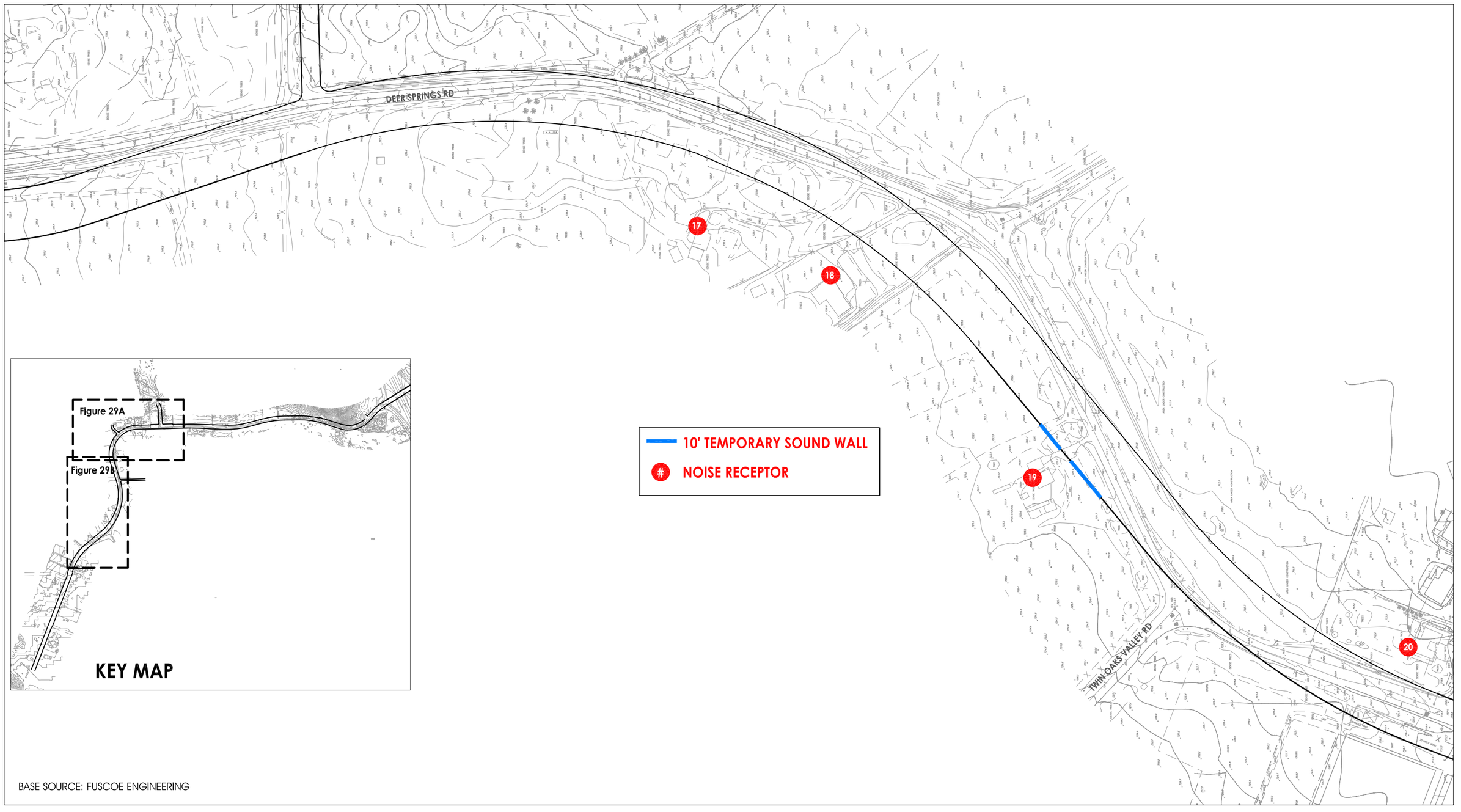
BASE SOURCE: FUSCOE ENGINEERING

Preliminary Noise Barrier Cross Sections A-A & B-B

FIGURE
28A

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

40 20 0 40
FEET



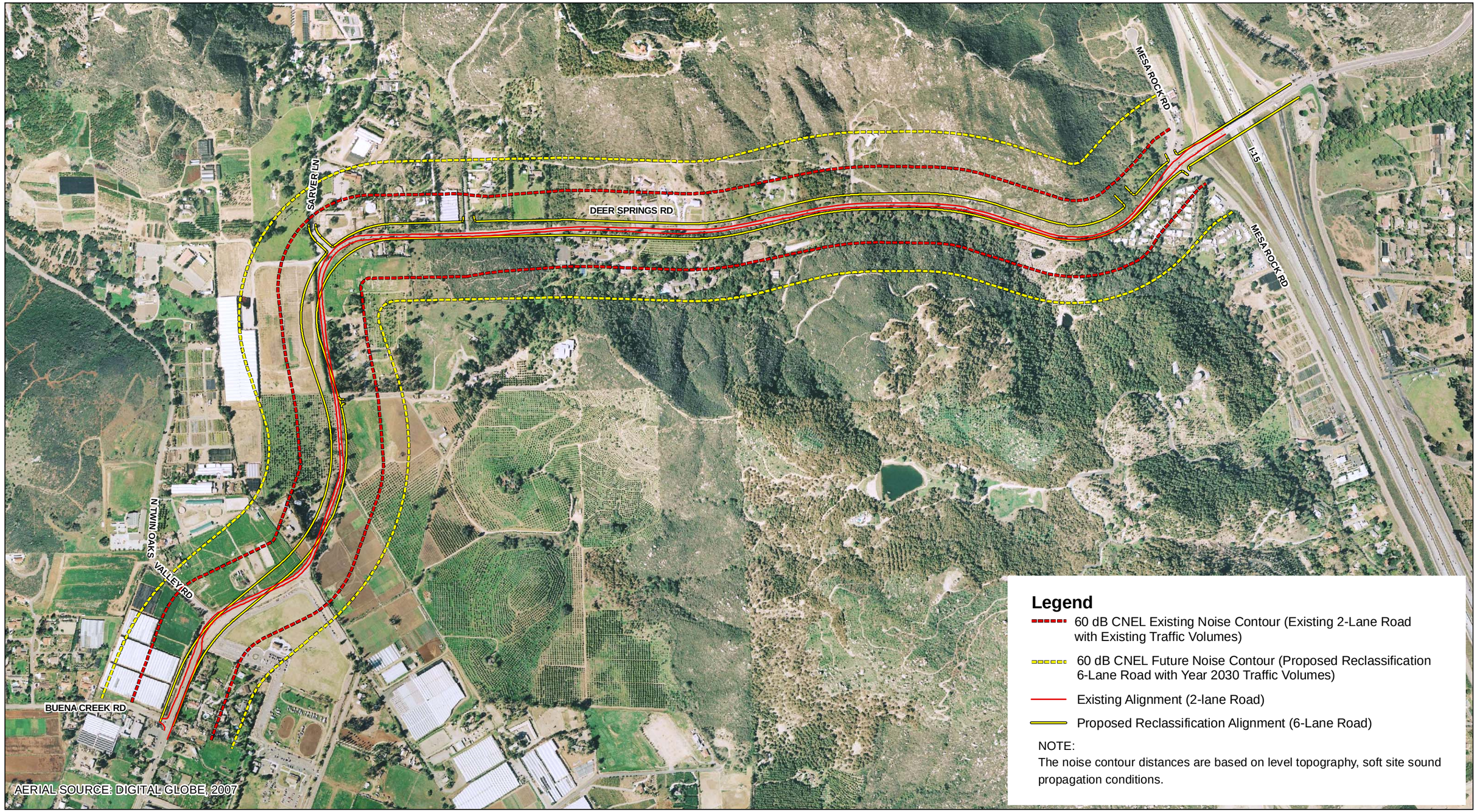
Preliminary Temporary Noise Barrier Heights & Locations

FIGURE 29B

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

200 100 0 200
FEET

N



Existing & Future 60 dB CNEL Noise Contours - Plan to Ground

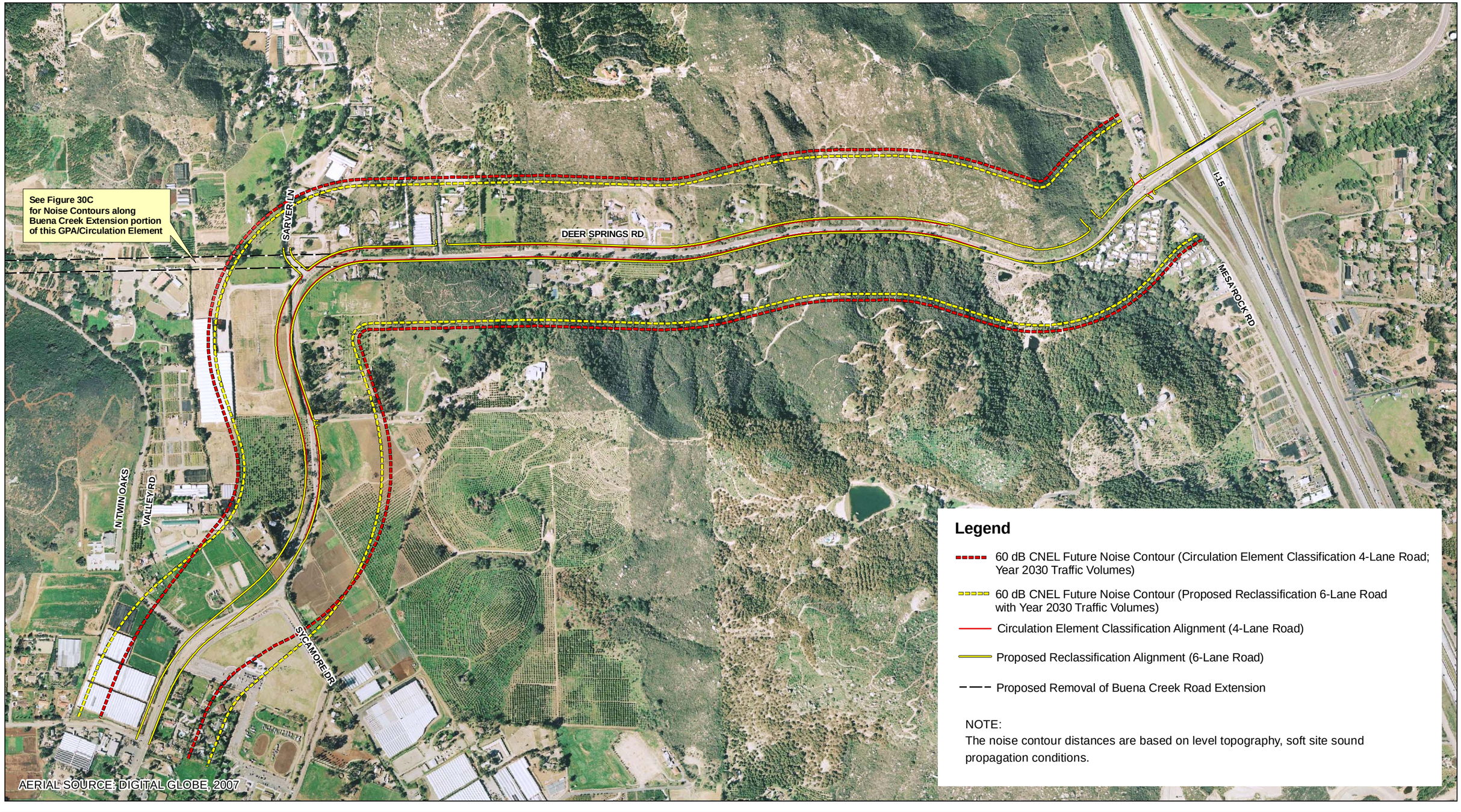
FIGURE 30A

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

0 400 800 1,600
Feet

N

Z:\Projects\387701\Figs_NOISE\Figs_Dec2008\NOISE_Fig30A_plan_ground.mxd



Future 60 dB CNEL Noise Contours - Plan to Plan

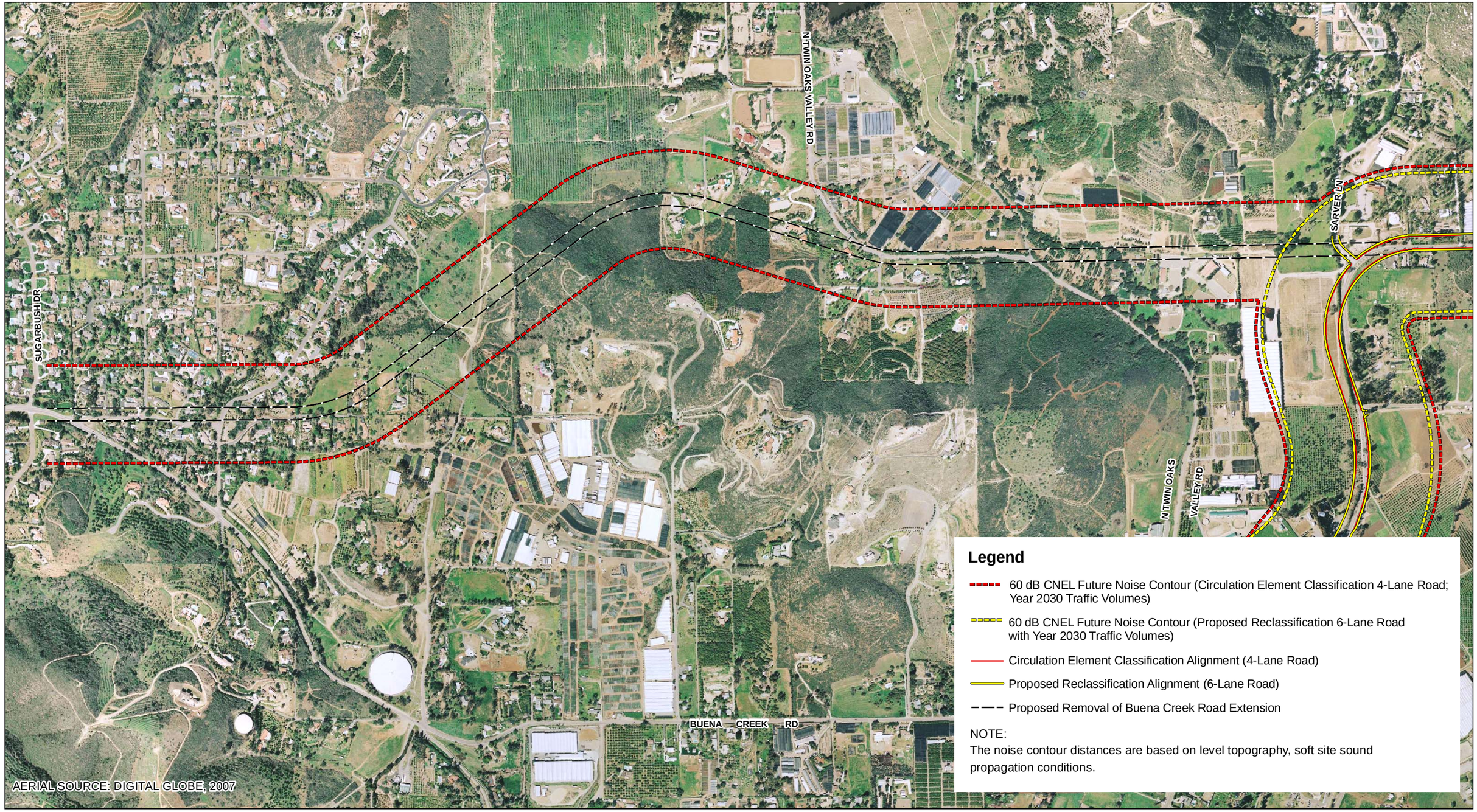
FIGURE
30B

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

0 400 800 1,600
Feet

N

Z:\Projects\j387701\Figs_NOISE\Figs_Dec2008\NOISE_Fig30B_plan_plan.mxd



Existing Circulation Element 60 dB CNEL Noise Contours - Buena Creek Road Extension

FIGURE
30C

MERRIAM MOUNTAINS SPECIFIC PLAN
ACOUSTICAL ASSESSMENT REPORT

0 400 800 1,600
Feet

N

Z:\Projects\j387701\Figs_NOISE\Figs_Dec2008\NOISE_Fig30C_extension.mxd

ATTACHMENT 1

Definitions

ATTACHMENT 1
DEFINITIONS

Term	Definition
Ambient Noise Level	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
A-Weighted Sound Level, (dB[A]) (Symbol L_A)	The sound pressure level in decibels as measured on a sound level meter using the A-weighted filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise.
Community Noise Equivalent Level, (CNEL)	CNEL is the A-weighted equivalent continuous sound exposure level for a 24-hour period with a ten dB adjustment added to sound levels occurring during nighttime hours (10:00 p.m. to 7:00 a.m.) and a five dB adjustment added to the sound levels occurring during the evening hours (7:00 p.m. to 10:00 p.m.).
Decibel, (dB)	A unit for measuring sound pressure level, equal to 10 times the logarithm to the base 10 of the ratio of the measured sound pressure squared to a reference pressure, which is 20 micropascals.
Maximum A-Weighted Sound Level, (MXFA) (Symbol L_{max})	The greatest sound level measured on a sound level meter during a designated time interval or event using fast time-averaging (125-ms) and A-weighting.
Equivalent Continuous Sound Level	The sound level corresponding to a steady state sound (Symbols L_{eq}) sound level containing the same total energy as a time varying signal over a given sample period. L_{eq} is designed to average all of the loud and quiet sound levels occurring over a specific time period.

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ATTACHMENT 2

Noise Level Calculations

Deer Springs Road Off-Site (Existing) w/o DSMHP (DSRwa.ex)
T-Deer Springs Road, 1
 883 , 55 , 19 , 55 , 19 , 55
T-Deer Springs Road, 2
 883 , 55 , 19 , 55 , 19 , 55
T-Deer Springs Road, 3
 783 , 55 , 17 , 55 , 17 , 55
T-Deer Springs Road, 4
 883 , 55 , 19 , 55 , 19 , 55
T-Deer Springs Road, 5
 883 , 55 , 19 , 55 , 19 , 55
T-Deer Springs Road, 6
 783 , 55 , 17 , 55 , 17 , 55
L-Eastbound, 1
N,6285964.3,2013341,732,
N,6286001.5,2013468,734,
N,6286010.3,2013635,736,
N,6285987.3,2013924,740,
N,6285961.8,2014152,744,
N,6285889.5,2014510,750,
N,6285846.3,2014814,756,
N,6285838.3,2014883,758,
N,6285827.4,2015097,762,
N,6285836.5,2015187,764,
N,6285859.3,2015275,766,
N,6285876.6,2015318,768,
N,6285909.7,2015369,770,
N,6286018.6,2015467,773,
N,6286096.1,2015498,775,
L-Eastbound, 2
N,6286096.1,2015498,775,
N,6286160.4,2015520,777,
N,6286188.1,2015526,778,
N,6286270.6,2015534,780,
N,6286337.6,2015538,782,
N,6286409.4,2015540,784,
N,6286476.2,2015541,786,
N,6286510.0,2015542,787,
N,6286541.7,2015542,788,
N,6286613.4,2015543,790,
N,6286777.5,2015546,796,
N,6286882.2,2015548,800,
N,6287038.9,2015551,806,
L-Eastbound, 3
N,6287038.9,2015551,806,
N,6287319.9,2015560,811,
N,6287715.7,2015590,806,
N,6288100.1,2015609,809,
N,6288577.1,2015594,812,
N,6289083.1,2015584,808,
N,6289283.3,2015598,806,
N,6289554.8,2015646,805,
N,6289935.5,2015727,811,
N,6290169.9,2015774,817,
N,6290337.0,2015796,823,
N,6290471.7,2015807,826,
L-Westbound, 4
N,6285952.9,2013345,732,
N,6285989.6,2013470,734,
N,6285998.3,2013635,736,
N,6285975.4,2013923,740,
N,6285949.9,2014151,744,
N,6285877.7,2014508,750,

```
N,6285834.5,2014812,756,
N,6285826.4,2014882,758,
N,6285815.4,2015097,763,
N,6285824.7,2015189,765,
N,6285847.9,2015279,766,
N,6285865.9,2015324,768,
N,6285900.5,2015377,770,
N,6286012.1,2015478,774,
N,6286092.0,2015509,776,
L-Westbound, 5
N,6286092.0,2015509,776,
N,6286157.1,2015531,778,
N,6286186.1,2015538,779,
N,6286269.7,2015546,780,
N,6286337.1,2015550,782,
N,6286409.1,2015552,784,
N,6286476.0,2015553,786,
N,6286509.8,2015554,797,
N,6286541.5,2015554,798,
N,6286613.2,2015555,790,
N,6286777.2,2015558,796,
N,6286882.0,2015560,800,
N,6287038.7,2015563,806,
L-Westbound, 6
N,6287038.7,2015563,806,
N,6287320.8,2015573,811,
N,6287713.8,2015602,806,
N,6288100.3,2015621,809,
N,6288578.5,2015606,812,
N,6289084.7,2015596,808,
N,6289282.8,2015610,806,
N,6289554.2,2015658,805,
N,6289918.8,2015736,811,
N,6290158.6,2015784,817,
N,6290328.0,2015807,823,
N,6290465.3,2015818,826,
B-Edge of Road and Topo, 1 , 2 , 0 ,0
6287172.8,2015292,874,874,
6287401.,2015530,812,812,
6287539.9,2015568,808,808,
6287717.9,2015579,805,805,
6288100.9,2015597,809,809,
6288578.7,2015586,812,812,
6289083.9,2015574,808,808,
6289285.5,2015591,806,806,
6289560.9,2015631,805,805,
6289957.,2015709,810,810,
6290159.,2015754,815,815,
B-Top of Slope, 2 , 2 , 0 ,0
6289550.59,2015744,816,816,
6289578.84,2015722,816,816,
6289617.96,2015711,816,816,
6289662.72,2015728,816,816,
6289660.77,2015772,816,816,
6289729.26,2015793,820,820,
6289748.13,2015742,820,820,
6289830.99,2015754,820,820,
6289912.01,2015832,820,820,
R, 1 , 67 ,500
6287905.08,2015523.80,802.,1/12
R, 2 , 67 ,500
6288132,2015315,779.,6/11
R, 3 , 67 ,500
```

```
6288499,2015322,780.,7/10
R, 4 , 67 ,500
6288657,2015175,765.,8/9
R, 5 , 67 ,500
6288906,2015237,770.,9/8
R, 6 , 67 ,500
6288820,2015917,856.,11/7
R, 7 , 67 ,500
6289084,2015857,850.,13/6
R, 8 , 67 ,500
6289618,2015872,830.,14/5
R, 9 , 67 ,500
6286491,2015692,803.,16/14
R, 10 , 67 ,500
6286656,2016092,919.,19/13
R, 11 , 67 ,500
6286505.60,2015388.54,788,21/15
R, 12 , 67 ,500
6286357.91,2015480.03,783,22/16
R, 13 , 67 ,500
6289846,2015669,814.,Site 8
D, 4.5
ALL,11,12
C,C
```

SOUND32 - RELEASE 07/30/91, MODIFIED 04/22/00

TITLE:
Deer Springs Road Off-Site (Existing) w/o DSMHP (DSRwa.ex)

1

BARRIER DATA
****

BAR ELE	0	1	BARRIER HEIGHTS 2	3	4	5	6	7	BAR ID	LENGTH	TYPE
1	-	0.*							B1 P1	335.4	
2	-	0.*							B1 P2	144.2	
3	-	0.*							B1 P3	178.4	
4	-	0.*							B1 P4	383.4	
5	-	0.*							B1 P5	477.6	
6	-	0.*							B1 P6	505.7	
7	-	0.*							B1 P7	202.2	
8	-	0.*							B1 P8	278.4	
9	-	0.*							B1 P9	403.6	
10	-	0.*							B1 P10	207.0	
11	-	0.*							B2 P1	36.0	
12	-	0.*							B2 P2	40.5	
13	-	0.*							B2 P3	47.6	
14	-	0.*							B2 P4	44.0	
15	-	0.*							B2 P5	71.8	
16	-	0.*							B2 P6	54.3	
17	-	0.*							B2 P7	83.9	
18	-	0.*							B2 P8	112.4	

0 1 2 3 4 5 6 7

1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	1/12	67.	500.	67.8
2	6/11	67.	500.	61.3
3	7/10	67.	500.	61.5
4	8/9	67.	500.	59.3
5	9/8	67.	500.	59.5
6	11/7	67.	500.	64.6
7	13/6	67.	500.	65.6
8	14/5	67.	500.	64.0
9	16/14	67.	500.	69.1
10	19/13	67.	500.	62.4
11	21/15	67.	500.	65.3
12	22/16	67.	500.	71.2
13	Site 8	67.	500.	73.9

BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.

```
Off-Site Deer Springs Existing  (DSRMHPa.Ex)
T-Deer Springs, 1
 783 , 50 , 17 , 50 , 17 , 50
T-Deer Springs, 2
 1071 , 50 , 23 , 50 , 23 , 50
T-Deer Springs, 3
 783 , 50 , 17 , 50 , 17 , 50
T-Deer Springs, 4
 1071 , 50 , 23 , 50 , 23 , 50
L-Westbound, 1
N,92390.,15535,948,
N,92547.,15552,960,
N,92630.,15576,967,
N,92720.,15618,976,
N,92809.,15679,982,
N,92899.,15768,987,
N,93002.,15890,994,
N,93101.,16015,999,
N,93227.,16134,1005,
L-Westbound, 2
N,93227.,16134,1005,
N,93336.,16263,1010,
L-Eastbound, 3
N,92391.,15523,948,
N,92550.,15540,960,
N,92634.,15565,967,
N,92726.,15608,976,
N,92816.,15670,982,
N,92907.,15760,987,
N,93011.,15883,994,
N,93110.,16007,999,
N,93236.,16126,1005,
L-Eastbound, 4
N,93236.,16126,1005,
N,93355.,16246,1010,
B-Edge of Road, 1 , 2 , 0 ,0
92391.,15519,948,948,
92550.,15536,960,960,
92636.,15561,967,967,
92728.,15604,976,976,
92819.,15667,982,982,
92910.,15758,987,987,
93014.,15880,994,994,
93127.,16005,999,999,
93238.,16123,1005,1005,
93372.,16232,1010,1010,
R, 1 , 67 ,500
93264,15938,995.,A/1
R, 2 , 67 ,500
93123.00,15850.00,992,B/2
R, 3 , 67 ,500
92973.5349,15741.2091,988,C/3
R, 4 , 67 ,500
92879.6116,15659.7796,983,D/4
R, 5 , 67 ,500
92630.3790,15519.3930,965,E/
R, 6 , 67 ,500
92879,15696,989.,Site7
C,C
```

SOUND32 - RELEASE 07/30/91, MODIFIED 04/22/00

TITLE:
Off-Site Deer Springs Existing (DSRMHPa.Ex)

1

BARRIER DATA
****

BAR ELE	0	BARRIER HEIGHTS 1	2	3	4	5	6	7	BAR ID	LENGTH	TYPE
1	-	0.*							B1 P1	160.4	
2	-	0.*							B1 P2	89.8	
3	-	0.*							B1 P3	102.0	
4	-	0.*							B1 P4	110.8	
5	-	0.*							B1 P5	128.8	
6	-	0.*							B1 P6	160.5	
7	-	0.*							B1 P7	168.6	
8	-	0.*							B1 P8	162.1	
9	-	0.*							B1 P9	172.8	

0 1 2 3 4 5 6 7

1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	A/1	67.	500.	62.7
2	B/2	67.	500.	64.2
3	C/3	67.	500.	66.2
4	D/4	67.	500.	66.9
5	E/	67.	500.	67.3
6	Site7	67.	500.	71.1

BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
1 1 1 1 1 1 1 1 1
CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
0. 0. 0. 0. 0. 0. 0. 0. 0.

```
Deer Springs Rd.  4-Ln DSR4La.EPC
T-Deer Springs Road, 1
 1601 , 55 , 33 , 55 , 33 , 55
T-Deer Springs Road, 2
 1603 , 55 , 33 , 55 , 33 , 55
T-Deer Springs Road, 3
 1603 , 55 , 33 , 55 , 33 , 55
T-Deer Springs Road, 4
 1967 , 55 , 41 , 55 , 41 , 55
T-Deer Springs Road, 5
 2398 , 55 , 50 , 55 , 50 , 55
T-Deer Springs Road, 6
 1601 , 55 , 33 , 55 , 33 , 55
T-Deer Springs Road, 7
 1603 , 55 , 33 , 55 , 33 , 55
T-Deer Springs Road, 8
 1603 , 55 , 33 , 55 , 33 , 55
T-Deer Springs Road, 9
 1967 , 55 , 41 , 55 , 41 , 55
T-Deer Springs Road, 10
 2398 , 55 , 50 , 55 , 50 , 55
L-Eastbound, 1
N,6285970.0,2014001,740,
N,6285899.6,2014245,745,
N,6285819.2,2014486,750,
N,6285746.9,2014759,755,
N,6285759.3,2015001,760,
N,6285807.2,2015144,764,
N,6285837.8,2015205,765,
N,6285965.9,2015369,770,
N,6286215.2,2015524,780,
N,6286364.4,2015563,785,
N,6286515.7,2015573,790,
N,6286674.3,2015577,795,
N,6286840.9,2015581,800,
N,6287062.5,2015585,805,
L-Eastbound, 2
N,6287062.5,2015585,805,
N,6287564.4,2015596,805,
N,6287866.7,2015603,800,
N,6288014.7,2015603,800,
N,6288291.8,2015594,805,
N,6288558.9,2015585,810,
N,6288962.1,2015572,812,
N,6289111.6,2015574,810,
N,6289535.9,2015636,808,
N,6289921.7,2015736,810,
N,6290157.1,2015789,815,
N,6290327.3,2015813,820,
N,6290468.3,2015823,825,
N,6290589.9,2015828,830,
N,6290701.1,2015829,835,
L-Eastbound, 3
N,6290701.1,2015829,835,
N,6290983.1,2015832,850,
N,6291358.5,2015805,875,
N,6291702.0,2015722,900,
N,6292042.2,2015607,925,
N,6292327.8,2015546,945,
N,6292401.7,2015548,950,
N,6292475.4,2015557,955,
N,6292551.2,2015571,960,
N,6292627.3,2015595,965,
```

N,6292704.2,2015629,970,
N,6292781.7,2015674,975,
N,6292857.8,2015731,980,
N,6292933.3,2015801,985,
L-Eastbound, 4
N,6292933.3,2015801,985,
N,6292999.4,2015883,990,
N,6293073.8,2015971,995,
N,6293165.1,2016064,1000,
N,6293284.8,2016158,1005,
L-Eastbound, 5
N,6293284.8,2016158,1005,
N,6293422.4,2016248,1010,
N,6293563.7,2016336,1015,
L-Westbound, 6
N,6285936.6,2013976,740,
N,6285862.9,2014234,745,
N,6285781.9,2014477,751,
N,6285705.1,2014785,758,
N,6285728.6,2015036,763,
N,6285772.4,2015159,766,
N,6285820.7,2015248,768,
N,6285941.9,2015397,774,
N,6286207.7,2015562,783,
N,6286354.0,2015601,787,
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L-Westbound, 7
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L-Westbound, 8
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L-Westbound, 9
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N,6293395.8,2016297,1010,
N,6293537.1,2016386,1015,
B-Edge of Road and Topo GD, 1 , 2 , 0 ,0
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6287537.44,2015557,805,805,
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6288294.30,2015558,805,805,
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6288959.65,2015534,812,812,
6289107.79,2015536,810,810,
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6289929.22,2015701,810,810,
B-Top of Slope, 2 , 2 , 0 ,0
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6289580.83,2015758,817,817,
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6289922.95,2015835,822,822,
6290017.91,2015848,824,824,
B-Edge of Road DSMHP, 3 , 2 , 0 ,0
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B-Edge of Road DSMHP, 4 , 2 , 0 ,0
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B-Edge of Road (west), 5 , 2 , 0 ,0
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6285441.19,2012677,723,723,
6285647.41,2012894,725,725,
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6286672.80,2015652,796,796,
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6287060.10,2015660,805,805,
6287562.10,2015671,805,805,
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B-Daylight, 8 , 2 , 0 ,0
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B-Edge of Road (west), 9 , 2 , 0 ,0
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R, 2 , 67 ,500
6288132,2015315,779.,6/11
R, 3 , 67 ,500
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R, 4 , 67 ,500
6288657,2015175,765.,8/9
R, 5 , 67 ,500
6288906,2015237,770.,9/8
R, 6 , 67 ,500
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R, 7 , 67 ,500
6289084,2015857,850.,13/6
R, 8 , 67 ,500
6289618,2015872,830.,14/5
R, 9 , 67 ,500
6286491,2015692,803.,16/14
R, 10 , 67 ,500
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R, 11 , 67 ,500
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R, 12 , 67 ,500
6286357.91,2015480.03,783,22/16
R, 13 , 67 ,500
6289846,2015669,814.,Site 8
R, 14 , 67 ,500
6293264,2015938,995.,A/1
R, 15 , 67 ,500
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R, 16 , 67 ,500
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R, 17 , 67 ,500
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R, 18 , 67 ,500
6292630.37,2015519.39,965,E/
D, 4.5
ALL,11,12
C,C
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43	-	0.*	B6	P6	263.2
44	-	0.*	B6	P7	138.1
45	-	0.*	B6	P8	108.1
46	-	0.*	B6	P9	201.2
47	-	0.*	B7	P1	325.3
48	-	0.*	B7	P2	160.4
49	-	0.*	B7	P3	163.4
50	-	0.*	B7	P4	162.1
51	-	0.*	B7	P5	162.1
52	-	0.*	B7	P6	225.1
53	-	0.*	B7	P7	502.1
54	-	0.*	B7	P8	304.1
55	-	0.*	B7	P9	149.5
56	-	0.*	B8	P1	47.2
57	-	0.*	B8	P2	88.3
58	-	0.*	B8	P3	71.4
59	-	0.*	B8	P4	21.8
60	-	0.*	B8	P5	210.8
61	-	0.*	B8	P6	74.5
62	-	0.*	B9	P1	277.7
63	-	0.*	B9	P2	267.7
64	-	0.*	B9	P3	401.2
65	-	0.*	B9	P4	139.5
66	-	0.*	B9	P5	424.9
67	-	0.*	B9	P6	394.1
68	-	0.*	B9	P7	246.5
69	-	0.*	B9	P8	176.2

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0 1 2 3 4 5 6 7

1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	1/12	67.	500.	70.3
2	6/11	67.	500.	63.0
3	7/10	67.	500.	62.3
4	8/9	67.	500.	60.7
5	9/8	67.	500.	61.1
6	11/7	67.	500.	67.7
7	13/6	67.	500.	68.7
8	14/5	67.	500.	67.5
9	16/14	67.	500.	73.2
10	19/13	67.	500.	65.3
11	21/15	67.	500.	66.4
12	22/16	67.	500.	71.5
13	Site 8	67.	500.	75.6
14	A/1	67.	500.	67.1
15	B/2	67.	500.	67.9
16	C/3	67.	500.	70.4
17	D/4	67.	500.	70.7
18	E/	67.	500.	69.1

BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION

0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.

0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.

Deer Springs Rd. 4-Ln (E+P+C Mitigated) DSR4La.Mit

T-Deer Springs Road, 1
1601 , 55 , 33 , 55 , 33 , 55
T-Deer Springs Road, 2
1603 , 55 , 33 , 55 , 33 , 55
T-Deer Springs Road, 3
1603 , 55 , 33 , 55 , 33 , 55
T-Deer Springs Road, 4
1967 , 55 , 41 , 55 , 41 , 55
T-Deer Springs Road, 5
2398 , 55 , 50 , 55 , 50 , 55
T-Deer Springs Road, 6
1601 , 55 , 33 , 55 , 33 , 55
T-Deer Springs Road, 7
1603 , 55 , 33 , 55 , 33 , 55
T-Deer Springs Road, 8
1603 , 55 , 33 , 55 , 33 , 55
T-Deer Springs Road, 9
1967 , 55 , 41 , 55 , 41 , 55
T-Deer Springs Road, 10
2398 , 55 , 50 , 55 , 50 , 55
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L-Eastbound, 2
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N,6287564.4,2015596,805,
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L-Eastbound, 4
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L-Westbound, 6
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L-Westbound, 8
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L-Westbound, 9
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N,6293537.1,2016386,1015,
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6289107.79,2015536,810,810,
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6289929.22,2015701,810,810,
B-Top of Slope, 2 , 2 , 0 ,0
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B-Edge of Road DSMHP, 3 , 2 , 0 ,0
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B-Wall 1, 5 , 2 , 0 ,0
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B-Edge of Road (west), 6 , 2 , 0 ,0
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B-Wall 2, 7 , 2 , 0 ,0
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B-Daylight, 8 , 2 , 0 ,0
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R, 2 , 67 ,500
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R, 3 , 67 ,500
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R, 4 , 67 ,500
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R, 5 , 67 ,500
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R, 6 , 67 ,500
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R, 7 , 67 ,500
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C,C
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SOUND32 - RELEASE 07/30/91, MODIFIED 04/22/00

TITLE:
Deer Springs Rd. 4-Ln (E+P+C Mitigated) DSR4La.Mit

1

BARRIER DATA
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BAR ELE	BARRIER HEIGHTS 0	1	2	3	4	5	6	7	BAR ID	LENGTH	TYPE
1	-	0.*							B1 P1	336.1	
2	-	0.*							B1 P2	139.3	
3	-	0.*							B1 P3	318.7	
4	-	0.*							B1 P4	155.0	
5	-	0.*							B1 P5	283.7	
6	-	0.*							B1 P6	263.7	
7	-	0.*							B1 P7	401.7	
8	-	0.*							B1 P8	148.5	
9	-	0.*							B1 P9	438.7	
10	-	0.*							B1 P10	400.0	
11	-	0.*							B2 P1	33.6	
12	-	0.*							B2 P2	100.8	
13	-	0.*							B2 P3	96.9	
14	-	0.*							B2 P4	154.0	
15	-	0.*							B2 P5	95.9	
16	-	0.*							B3 P1	78.2	
17	-	3.*							B3 P2	80.4	
18	-	6.*							B3 P3	84.3	
19	-	6.*							B3 P4	88.4	
20	-	6.*							B3 P5	92.9	
21	-	6.*							B3 P6	98.7	
22	-	6.*							B3 P7	107.2	
23	-	6.*							B3 P8	106.7	
24	-	6.*							B3 P9	115.9	
25	-	6.*							B4 P1	126.0	
26	-	6.*							B4 P2	111.2	
27	-	6.*							B4 P3	64.5	
28	-	6.*							B4 P4	46.5	
29	-	0.*							B5 P1	421.8	
30	-	0.*							B5 P2	357.3	
31	-	0.*							B5 P3	372.5	
32	-	3.*							B5 P4	559.3	
33	-	6.*							B5 P5	299.6	
34	-	6.*							B5 P6	89.6	
35	-	6.*							B5 P7	217.8	
36	-	6.*							B5 P8	133.2	
37	-	6.*							B5 P9	187.7	
38	-	0.*							B6 P1	280.0	
39	-	0.*							B6 P2	229.5	
40	-	0.*							B6 P3	264.2	
41	-	0.*							B6 P4	256.2	
42	-	0.*							B6 P5	325.8	

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43      -    0.*                                   B6  P6       263.2
44      -    0.*                                   B6  P7       138.1
45      -    0.*                                   B6  P8       108.1
46      -    0.*                                   B6  P9       201.2

47      -    8.*                                   B7  P1       154.2

48      -    0.*                                   B8  P1        47.2
49      -    0.*                                   B8  P2        88.3
50      -    0.*                                   B8  P3        71.4
51      -    0.*                                   B8  P4        21.8
52      -    0.*                                   B8  P5       210.8
53      -    0.*                                   B8  P6        74.5

54      -    0.*                                   B9  P1       277.7
55      -    0.*                                   B9  P2       267.7
56      -    0.*                                   B9  P3       401.2
57      -    0.*                                   B9  P4       139.5
58      -    4.*                                   B9  P5       424.9
59      -    4.*                                   B9  P6       394.2
60      -    0.*                                   B9  P7       246.5
61      -    0.*                                   B9  P8       176.2
--------------------------------------------------------------------------------
        0    1    2    3    4    5    6    7
1
REC REC ID     DNL  PEOPLE   LEQ(CAL)
--------------------------------
 1  14/5       67.     500.   66.8
 2  16/14      67.     500.   69.3
 3  A/1        67.     500.   62.9
 4  B/2        67.     500.   64.2
 5  C/3        67.     500.   66.5
 6  D/4        67.     500.   66.6
 7  E/         67.     500.   65.2
BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1
  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1
  1  1  1  1  1  1  1  1  1  1  1
CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 3. 6. 6. 6. 6. 6. 6. 6. 6.
 6. 6. 6. 0. 0. 0. 3. 6. 6. 6. 6. 6. 0. 0. 0. 0. 0. 0. 0. 0. 0. 8. 0. 0. 0.
 0. 0. 0. 0. 0. 0. 0. 4. 4. 0. 0.
```

```
Twin Oaks Valley Rd./DSR TOVRa.ex
T-Twin Oaks Valley Road, 1
 929 , 45 , 19 , 45 , 19 , 45
T-Twin Oaks Valley Road, 2
 874 , 45 , 18 , 45 , 18 , 45
T-Twin Oaks Valley Road, 3
 874 , 45 , 18 , 45 , 18 , 45
T-Twin Oaks Valley Road, 4
 883 , 45 , 18 , 45 , 18 , 45
T-Twin Oaks Valley Road, 5
 883 , 55 , 18 , 55 , 18 , 55
T-Twin Oaks Valley Road, 6
 929 , 45 , 19 , 45 , 19 , 45
T-Twin Oaks Valley Road, 7
 874 , 45 , 18 , 45 , 18 , 45
T-Twin Oaks Valley Road, 8
 874 , 45 , 18 , 45 , 18 , 45
T-Twin Oaks Valley Road, 9
 883 , 45 , 18 , 45 , 18 , 45
T-Twin Oaks Valley Road, 10
 883 , 55 , 18 , 55 , 18 , 55
L-Eastbound, 1
N,6283479.5,2008605,679,
N,6283558.1,2008804,682,
N,6283622.1,2008970,685,
N,6283824.2,2009513,690,
N,6283958.3,2009861,695,
L-Eastbound, 2
N,6283958.3,2009861,695,
N,6284219.5,2010552,705,
N,6284351.0,2010898,710,
N,6284509.9,2011311,715,
L-Eastbound, 3
N,6284509.9,2011311,715,
N,6284611.4,2011543,717,
N,6284674.3,2011708,720,
N,6284730.9,2011894,723,
N,6284788.3,2012052,724,
N,6284840.5,2012147,724,
N,6284886.6,2012205,723,
N,6284922.0,2012239,723,
N,6285003.2,2012295,723,
L-Eastbound, 4
N,6285003.2,2012295,723,
N,6285506.7,2012534,726,
N,6285625.9,2012603,727,
N,6285691.7,2012669,727,
N,6285745.6,2012753,727,
N,6285818.3,2012934,728,
L-Eastbound, 5
N,6285818.3,2012934,728,
N,6285931.0,2013245,730,
N,6285964.3,2013341,732,
N,6286001.5,2013468,734,
N,6286010.3,2013635,736,
N,6285987.3,2013924,740,
N,6285961.8,2014152,744,
N,6285889.5,2014510,750,
L-Westbound, 6
N,6283447.8,2008617,679,
N,6283526.4,2008816,682,
N,6283590.3,2008983,685,
N,6283803.6,2009521,690,
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N,6283937.7,2009869,695,
L-Westbound, 7
N,6283937.7,2009869,695,
N,6284198.9,2010560,705,
N,6284330.4,2010905,710,
N,6284489.4,2011318,715,
L-Westbound, 8
N,6284489.4,2011318,715,
N,6284590.9,2011551,717,
N,6284652.4,2011714,720,
N,6284719.5,2011898,723,
N,6284777.3,2012057,724,
N,6284830.4,2012154,724,
N,6284877.7,2012213,723,
N,6284914.4,2012248,723,
N,6284997.2,2012305,723,
L-Westbound, 9
N,6284997.2,2012305,723,
N,6285501.1,2012544,726,
N,6285618.5,2012613,727,
N,6285682.3,2012677,727,
N,6285734.8,2012759,727,
N,6285807.1,2012938,728,
L-Westbound, 10
N,6285807.1,2012938,728,
N,6285919.7,2013249,730,
N,6285952.9,2013345,732,
N,6285989.6,2013470,734,
N,6285998.3,2013635,736,
N,6285975.4,2013923,740,
N,6285949.9,2014151,744,
N,6285877.7,2014508,750,
R, 1 , 67 ,500
6283877,2009220,693.,T1/25
R, 2 , 67 ,500
6283964.48,2009697.80,698.,T2/24
R, 3 , 67 ,500
6284429,2010806,712,T3/23
R, 4 , 67 ,500
6284468.34,2010867,711,T4/22
R, 5 , 67 ,500
6284549.86,2011131,715,T5/21
R, 6 , 67 ,500
6284250,2010920,717,T6/26
R, 7 , 67 ,500
6284063.38,2010458.00,709,T7/27
R, 8 , 67 ,500
6283877.20,2009914.37,701,T8/28
R, 9 , 67 ,500
6283683.33,2009621.44,698,T9/29
R, 10 , 67 ,500
6283550.90,2009123.96,693,T10/30
R, 11 , 67 ,500
6283444.57,2008901.10,686,T11/31
R, 12 , 67 ,500
6284312,2010642,711.,Site 9
R, 13 , 67 ,500
6285586,2012987,733.,23/18
R, 14 , 67 ,500
6285149,2012549,728.,25/19
R, 15 , 67 ,500
6284784,2011737,723.,26/20
R, 16 , 67 ,500
```

6285691,2013275,739.,30/17
D, 4.5
ALL,ALL
C,C

SOUND32 - RELEASE 07/30/91, MODIFIED 04/22/00

TITLE:
Twin Oaks Valley Rd./DSR TOVRa.ex

BASED ON FHWA-RD-108 AND
CALIFORNIA REFERENCE ENERGY MEAN EMISSION LEVELS

RECEIVER	LEQ
T1/25	62.9
T2/24	68.3
T3/23	65.2
T4/22	64.3
T5/21	65.4
T6/26	66.8
T7/27	66.1
T8/28	67.5
T9/29	63.2
T10/30	66.1
T11/31	64.8
Site 9	69.1
23/18	61.9
25/19	63.0
26/20	65.8
30/17	62.5

Twin Oaks Valley Rd./DSR 12/2008 4-Ln TOVR4La.epc
T-Twin Oaks Valley Road, 1
 1390 , 50 , 29 , 50 , 29 , 50
T-Twin Oaks Valley Road, 2
 1372 , 50 , 29 , 50 , 29 , 50
T-Twin Oaks Valley Road, 3
 1486 , 50 , 31 , 50 , 31 , 50
T-Twin Oaks Valley Road, 4
 1601 , 55 , 33 , 55 , 33 , 55
T-Deer Springs Road, 5
 1601 , 55 , 33 , 55 , 33 , 55
T-Twin Oaks Valley Road, 6
 1390 , 50 , 29 , 50 , 29 , 50
T-Twin Oaks Valley Road, 7
 1372 , 50 , 29 , 50 , 29 , 50
T-Twin Oaks Valley Road, 8
 1486 , 50 , 31 , 50 , 31 , 50
T-Twin Oaks Valley Road, 9
 1601 , 55 , 33 , 55 , 33 , 55
T-Deer Springs Road, 10
 1601 , 55 , 33 , 55 , 33 , 55
L-Eastbound, 1
N,6283479.5,2008605,679,
N,6283558.1,2008804,682,
N,6283622.1,2008970,685,
N,6283829.8,2009510,690,
N,6283963.9,2009859,695,
L-Eastbound, 2
N,6283963.9,2009859,695,
N,6284225.1,2010550,705,
N,6284356.6,2010895,710,
N,6284508.1,2011312,714,
L-Eastbound, 3
N,6284508.1,2011312,714,
N,6284659.0,2011700,720,
N,6284822.4,2012001,724,
N,6285066.1,2012261,723,
L-Eastbound, 4
N,6285066.1,2012261,723,
N,6285496.7,2012618,723,
N,6285711.0,2012844,725,
N,6285774.1,2012932,725,
N,6285878.9,2013122,727,
N,6285928.8,2013257,728,
L-Eastbound, 5
N,6285928.8,2013257,728,
N,6285981.4,2013475,730,
N,6286000.3,2013751,735,
N,6285970.0,2014001,740,
N,6285899.6,2014245,745,
N,6285819.2,2014486,750,
L-Westbound, 6
N,6283447.8,2008617,679,
N,6283526.4,2008816,682,
N,6283590.3,2008983,685,
N,6283798.0,2009523,690,
N,6283932.1,2009871,695,
L-Westbound, 7
N,6283932.1,2009871,695,
N,6284193.3,2010562,705,
N,6284324.8,2010908,710,
N,6284467.1,2011328,714,
L-Westbound, 8

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N,6284467.1,2011328,714,
N,6284619.0,2011719,720,
N,6284786.4,2012027,724,
N,6285035.9,2012293,723,
L-Westbound, 9
N,6285035.9,2012293,723,
N,6285466.4,2012650,723,
N,6285676.0,2012870,725,
N,6285730.9,2012948,725,
N,6285839.2,2013141,727,
N,6285891.9,2013268,728,
L-Westbound, 10
N,6285891.9,2013268,728,
N,6285939.8,2013456,730,
N,6285962.5,2013742,735,
N,6285936.6,2013976,740,
N,6285862.9,2014234,745,
N,6285781.9,2014477,751,
B-Edge of Road (west), 1 , 2 , 0 ,0
6284432.65,2011341,714,714,
6284585.44,2011734,720,720,
6284756.23,2012048,724,724,
6285010.53,2012320,723,723,
6285441.19,2012677,723,723,
6285647.41,2012894,725,725,
6285699.64,2012967,725,725,
6285805.94,2013157,727,727,
6285856.75,2013280,728,728,
6285903.25,2013462,730,730,
B-Edge of Road (west), 2 , 2 , 0 ,0
6285903.25,2013462,730,730,
6285925.38,2013741,735,735,
6285900.21,2013969,740,740,
6285827.62,2014223,745,745,
6285746.36,2014466,751,751,
6285667.69,2014782,758,758,
6285692.20,2015044,763,763,
6285738.57,2015174,766,766,
6285789.83,2015269,768,768,
6285917.18,2015425,774,774,
R, 1 , 67 ,500
6283877,2009220,693.,T1/25
R, 2 , 67 ,500
6283964.48,2009697.80,698.,T2/24
R, 3 , 67 ,500
6284429,2010806,712,T3/23
R, 4 , 67 ,500
6284468.34,2010867,711,T4/22
R, 5 , 67 ,500
6284549.86,2011131,715,T5/21
R, 6 , 67 ,500
6284250,2010920,717,T6/26
R, 7 , 67 ,500
6284063.38,2010458.00,709,T7/27
R, 8 , 67 ,500
6283877.20,2009914.37,701,T8/28
R, 9 , 67 ,500
6283683.33,2009621.44,698,T9/29
R, 10 , 67 ,500
6283550.90,2009123.96,693,T10/30
R, 11 , 67 ,500
6283444.57,2008901.10,686,T11/31
R, 12 , 67 ,500
```

```
6284312,2010642,711.,Site 9
R, 13 , 67 ,500
6285586,2012987,733.,23/18
R, 14 , 67 ,500
6285149,2012549,728.,25/19
R, 15 , 67 ,500
6284784,2011737,723.,26/20
R, 16 , 67 ,500
6285691,2013275,739.,30/17
D, 4.5
ALL,ALL
C,C
```

SOUND32 - RELEASE 07/30/91, MODIFIED 04/22/00

TITLE:
Twin Oaks Valley Rd./DSR 12/2008 4-Ln TOVR4La.epc

1

BARRIER DATA
****

BAR ELE	0	1	BARRIER HEIGHTS 2	3	4	5	6	7	BAR ID	LENGTH	TYPE
1	-	0.*							B1 P1	421.8	
2	-	0.*							B1 P2	357.3	
3	-	0.*							B1 P3	372.5	
4	-	0.*							B1 P4	559.3	
5	-	0.*							B1 P5	299.6	
6	-	0.*							B1 P6	89.6	
7	-	0.*							B1 P7	217.8	
8	-	0.*							B1 P8	133.2	
9	-	0.*							B1 P9	187.7	
10	-	0.*							B2 P1	280.0	
11	-	0.*							B2 P2	229.5	
12	-	0.*							B2 P3	264.2	
13	-	0.*							B2 P4	256.2	
14	-	0.*							B2 P5	325.8	
15	-	0.*							B2 P6	263.2	
16	-	0.*							B2 P7	138.1	
17	-	0.*							B2 P8	108.1	
18	-	0.*							B2 P9	201.2	

0 1 2 3 4 5 6 7

1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	T1/25	67.	500.	65.8
2	T2/24	67.	500.	71.4
3	T3/23	67.	500.	68.3
4	T4/22	67.	500.	67.4
5	T5/21	67.	500.	68.1
6	T6/26	67.	500.	70.0
7	T7/27	67.	500.	69.2
8	T8/28	67.	500.	70.6
9	T9/29	67.	500.	66.1
10	T10/30	67.	500.	69.0
11	T11/31	67.	500.	67.6
12	Site 9	67.	500.	72.5
13	23/18	67.	500.	67.4
14	25/19	67.	500.	67.2
15	26/20	67.	500.	69.0
16	30/17	67.	500.	66.0

BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1

CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.

```
Twin Oaks Valley Rd./DSR 12/2008 4-Ln TOVR4La.mit
T-Twin Oaks Valley Road, 1
 1390 , 50 , 29 , 50 , 29 , 50
T-Twin Oaks Valley Road, 2
 1372 , 50 , 29 , 50 , 29 , 50
T-Twin Oaks Valley Road, 3
 1486 , 50 , 31 , 50 , 31 , 50
T-Twin Oaks Valley Road, 4
 1601 , 55 , 33 , 55 , 33 , 55
T-Deer Springs Road, 5
 1601 , 55 , 33 , 55 , 33 , 55
T-Twin Oaks Valley Road, 6
 1390 , 50 , 29 , 50 , 29 , 50
T-Twin Oaks Valley Road, 7
 1372 , 50 , 29 , 50 , 29 , 50
T-Twin Oaks Valley Road, 8
 1486 , 50 , 31 , 50 , 31 , 50
T-Twin Oaks Valley Road, 9
 1601 , 55 , 33 , 55 , 33 , 55
T-Deer Springs Road, 10
 1601 , 55 , 33 , 55 , 33 , 55
L-Eastbound, 1
N,6283479.5,2008605,679,
N,6283558.1,2008804,682,
N,6283622.1,2008970,685,
N,6283829.8,2009510,690,
N,6283963.9,2009859,695,
L-Eastbound, 2
N,6283963.9,2009859,695,
N,6284225.1,2010550,705,
N,6284356.6,2010895,710,
N,6284508.1,2011312,714,
L-Eastbound, 3
N,6284508.1,2011312,714,
N,6284659.0,2011700,720,
N,6284822.4,2012001,724,
N,6285066.1,2012261,723,
L-Eastbound, 4
N,6285066.1,2012261,723,
N,6285496.7,2012618,723,
N,6285711.0,2012844,725,
N,6285774.1,2012932,725,
N,6285878.9,2013122,727,
N,6285928.8,2013257,728,
L-Eastbound, 5
N,6285928.8,2013257,728,
N,6285981.4,2013475,730,
N,6286000.3,2013751,735,
N,6285970.0,2014001,740,
N,6285899.6,2014245,745,
N,6285819.2,2014486,750,
L-Westbound, 6
N,6283447.8,2008617,679,
N,6283526.4,2008816,682,
N,6283590.3,2008983,685,
N,6283798.0,2009523,690,
N,6283932.1,2009871,695,
L-Westbound, 7
N,6283932.1,2009871,695,
N,6284193.3,2010562,705,
N,6284324.8,2010908,710,
N,6284467.1,2011328,714,
L-Westbound, 8
```

```
N,6284467.1,2011328,714,
N,6284619.0,2011719,720,
N,6284786.4,2012027,724,
N,6285035.9,2012293,723,
L-Westbound, 9
N,6285035.9,2012293,723,
N,6285466.4,2012650,723,
N,6285676.0,2012870,725,
N,6285730.9,2012948,725,
N,6285839.2,2013141,727,
N,6285891.9,2013268,728,
L-Westbound, 10
N,6285891.9,2013268,728,
N,6285939.8,2013456,730,
N,6285962.5,2013742,735,
N,6285936.6,2013976,740,
N,6285862.9,2014234,745,
N,6285781.9,2014477,751,
B-Edge of Road (west), 1 , 2 , 0 ,0
6284432.65,2011341,714,720,
6284585.44,2011734,720,726,
6284756.23,2012048,724,730,
6285010.53,2012320,723,729,
6285441.19,2012677,723,729,
6285647.41,2012894,725,731,
6285699.64,2012967,725,731,
6285805.94,2013157,727,733,
6285856.75,2013280,728,734,
6285903.25,2013462,730,736,
B-Edge of Road (west), 2 , 2 , 0 ,0
6285903.25,2013462,730,736,
6285925.38,2013741,735,741,
6285900.21,2013969,740,746,
6285827.62,2014223,745,751,
6285746.36,2014466,751,756,
R, 1 , 67 ,500
6285586,2012987,733.,23/18
R, 2 , 67 ,500
6285149,2012549,728.,25/19
R, 3 , 67 ,500
6285691,2013275,739.,30/17
D, 4.5
ALL,ALL
C,C
```

SOUND32 - RELEASE 07/30/91, MODIFIED 04/22/00

TITLE:
Twin Oaks Valley Rd./DSR 12/2008 4-Ln TOVR4La.mit

1

BARRIER DATA
****

BAR ELE	0	1	2	3	4	5	6	7	BAR ID	LENGTH	TYPE
1	-	6.*							B1 P1	421.8	
2	-	6.*							B1 P2	357.3	
3	-	6.*							B1 P3	372.5	
4	-	6.*							B1 P4	559.3	
5	-	6.*							B1 P5	299.6	
6	-	6.*							B1 P6	89.6	
7	-	6.*							B1 P7	217.8	
8	-	6.*							B1 P8	133.2	
9	-	6.*							B1 P9	187.7	
10	-	6.*							B2 P1	280.0	
11	-	6.*							B2 P2	229.5	
12	-	6.*							B2 P3	264.2	
13	-	6.*							B2 P4	256.2	
	0	1	2	3	4	5	6	7			

1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	23/18	67.	500.	65.3
2	25/19	67.	500.	64.9
3	30/17	67.	500.	64.3

BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
1 1 1 1 1 1 1 1 1 1 1 1 1

CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6. 6.

```
Future, MF Lot 4, 1st floor, 20 to 400 foot setback (MerMF41.fut)
T-I-15, 1
 15761 , 65 , 446 , 65 , 943 , 65
T-I-15, 2
 15761 , 65 , 446 , 65 , 943 , 65
L-Northbound, 1
N,91934.,20155,915,
N,92440.,19317,945,
N,92705.,18836,960,
N,92927.,18425,970,
N,93055.,18176,975,
N,93202.,17901,980,
N,93434.,17415,985,
N,93671.,16917,990,
N,93859.,16515,995,
L-Southbound, 2
N,91806.,20086,930,
N,92267.,19324,955,
N,92515.,18891,965,
N,92858.,18267,975,
N,93006.,18000,980,
N,93290.,17429,985,
N,93526.,16939,990,
N,93764.,16426,995,
B-Edge of Slope and Berm, 1 , 2 , 0 ,0
92456.,17332,1065,1065,t1
92657.,17474,1065,1065,t2
92860.,17474,1065,1065,t3
92928.,17498,1072,1073,t4
92907.,17621,1065,1073,t5
92887.,17663,1065,1073,t6
92625.,18090,1070,1078,t7
92451.,18306,1073,1081,t8
92299.,18471,1075,1083,t9
92229.,18585,1076,1084,t10
B-Top of Berm, 2 , 2 , 0 ,0
92229.,18585,1076,1084,t10
92185.,18611,1076,1084,t11
92125.,18612,1077,1085,t12
91942.,18543,1077,1085,t13
91904.,18476,1077,1085,t14
R, 1 , 66 ,5
92871,17652,1070.,20
R, 2 , 66 ,5
92609,18079,1075.,20
R, 3 , 66 ,5
92282,18461,1080.,20
R, 4 , 66 ,5
92152,18591,1082.,20
R, 5 , 66 ,5
92837,17629,1070.,40
R, 6 , 66 ,5
92576,18056,1075.,40
R, 7 , 66 ,5
92249,18438,1080.,40
R, 8 , 66 ,5
92153,18552,1081.,40
R, 9 , 66 ,5
92804,17606,1070.,60
R, 10 , 66 ,5
92543,18033,1075.,60
R, 11 , 66 ,5
92216,18415,1080.,60
```

```
R, 12 , 66 ,5
92150,18512,1082.,60
R, 13 , 66 ,5
92753,17614,1070.,80
R, 14 , 66 ,5
92510,18010,1075.,80
R, 15 , 66 ,5
92184,18393,1080.,80
R, 16 , 66 ,5
92137,18467,1081.,80
R, 17 , 66 ,5
92645,17674,1072.,200
R, 18 , 66 ,5
92460,17976,1075.,200
R, 19 , 66 ,5
92134,18358,1080.,200
R, 20 , 66 ,5
92495,17728,1073.,300
R, 21 , 66 ,5
92378,17919,1075.,300
R, 22 , 67 ,5
92052,18301,1080.,300
R, 23 , 67 ,5
92361,17755,1074.,400
R, 24 , 67 ,5
92295,17862,1075.,400
R, 25 , 67 ,5
92011,18273,1080.,400
K, 2
ALL,ALL
C,C
```

SOUND32 - RELEASE 07/30/91, MODIFIED 04/22/00

TITLE:
Future, MF Lot 4, 1st floor, 20 to 400 foot setback (MerMF41.fut)

1

BARRIER DATA
****

BAR ELE	0	1	2	3	4	5	6	7	BAR ID	LENGTH	TYPE
1	-	0.*							t1	246.1	
2	-	0.*							t2	203.0	
3	-	1.*							t3	72.6	
4	-	5.*							t4	124.8	
5	-	8.*							t5	46.5	
6	-	8.*							t6	501.0	
7	-	8.*							t7	277.4	
8	-	8.*							t8	224.4	
9	-	8.*							t9	133.8	
10	-	8.*							t10	51.1	
11	-	8.*							t11	60.0	
12	-	8.*							t12	195.6	
13	-	8.*							t13	77.0	
	0	1	2	3	4	5	6	7			

1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	20	66.	5.	69.1
2	20	66.	5.	68.7
3	20	66.	5.	67.4
4	20	66.	5.	66.9
5	40	66.	5.	66.8
6	40	66.	5.	66.3
7	40	66.	5.	64.9
8	40	66.	5.	64.8
9	60	66.	5.	65.4
10	60	66.	5.	64.5
11	60	66.	5.	63.2
12	60	66.	5.	64.0
13	80	66.	5.	64.6
14	80	66.	5.	63.2
15	80	66.	5.	62.1
16	80	66.	5.	62.5
17	200	66.	5.	63.5
18	200	66.	5.	61.9
19	200	66.	5.	60.8
20	300	66.	5.	62.0
21	300	66.	5.	60.8
22	300	67.	5.	59.6
23	400	67.	5.	61.0
24	400	67.	5.	60.2
25	400	67.	5.	59.2

BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
1 1 1 1 1 1 1 1 1 1 1 1 1
CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION

0. 0. 1. 5. 8. 8. 8. 8. 8. 8. 8. 8. 8.

```
Future, MF Lot 4, 2nd floor, 20 to 400 foot setback (MerMF42.fut)
T-I-15, 1
 15761 , 65 , 446 , 65 , 943 , 65
T-I-15, 2
 15761 , 65 , 446 , 65 , 943 , 65
L-Northbound, 1
N,91934.,20155,915,
N,92440.,19317,945,
N,92705.,18836,960,
N,92927.,18425,970,
N,93055.,18176,975,
N,93202.,17901,980,
N,93434.,17415,985,
N,93671.,16917,990,
N,93859.,16515,995,
L-Southbound, 2
N,91806.,20086,930,
N,92267.,19324,955,
N,92515.,18891,965,
N,92858.,18267,975,
N,93006.,18000,980,
N,93290.,17429,985,
N,93526.,16939,990,
N,93764.,16426,995,
B-Edge of Slope and Berm, 1 , 2 , 0 ,0
92456.,17332,1065,1065,t1
92657.,17474,1065,1065,t2
92860.,17474,1065,1065,t3
92928.,17498,1072,1073,t4
92907.,17621,1065,1073,t5
92887.,17663,1065,1073,t6
92625.,18090,1070,1078,t7
92451.,18306,1073,1081,t8
92299.,18471,1075,1083,t9
92229.,18585,1076,1084,t10
B-Top of Berm, 2 , 2 , 0 ,0
92229.,18585,1076,1084,t10
92185.,18611,1076,1084,t11
92125.,18612,1077,1085,t12
91942.,18543,1077,1085,t13
91904.,18476,1077,1085,t14
R, 1 , 66 ,5
92871,17652,1080.,20
R, 2 , 66 ,5
92609,18079,1085.,20
R, 3 , 66 ,5
92282,18461,1090.,20
R, 4 , 66 ,5
92152,18591,1092.,20
R, 5 , 66 ,5
92837,17629,1080.,40
R, 6 , 66 ,5
92576,18056,1085.,40
R, 7 , 66 ,5
92249,18438,1090.,40
R, 8 , 66 ,5
92153,18552,1091.,40
R, 9 , 66 ,5
92804,17606,1080.,60
R, 10 , 66 ,5
92543,18033,1085.,60
R, 11 , 66 ,5
92216,18415,1090.,60
```

```
R, 12 , 66 ,5
92150,18512,1092.,60
R, 13 , 66 ,5
92753,17614,1080.,80
R, 14 , 66 ,5
92510,18010,1085.,80
R, 15 , 66 ,5
92184,18393,1090.,80
R, 16 , 66 ,5
92137,18467,1091.,80
R, 17 , 66 ,5
92645,17674,1082.,200
R, 18 , 66 ,5
92460,17976,1085.,200
R, 19 , 66 ,5
92134,18358,1090.,200
R, 20 , 66 ,5
92495,17728,1083.,300
R, 21 , 66 ,5
92378,17919,1085.,300
R, 22 , 67 ,5
92052,18301,1090.,300
R, 23 , 67 ,5
92361,17755,1084.,400
R, 24 , 67 ,5
92295,17862,1085.,400
R, 25 , 67 ,5
92011,18273,1090.,400
R, 26 , 67 ,500
92588,18065,1085.,35
K, 2
ALL,ALL
C,C
```

SOUND32 - RELEASE 07/30/91, MODIFIED 04/22/00

TITLE:
Future, MF Lot 4, 2nd floor, 20 to 400 foot setback (MerMF42.fut)

1

BARRIER DATA
****

BAR ELE	0	1	2	3	4	5	6	7	BAR ID	LENGTH	TYPE
1	-	0.*							t1	246.1	
2	-	0.*							t2	203.0	
3	-	1.*							t3	72.6	
4	-	5.*							t4	124.8	
5	-	8.*							t5	46.5	
6	-	8.*							t6	501.0	
7	-	8.*							t7	277.4	
8	-	8.*							t8	224.4	
9	-	8.*							t9	133.8	
10	-	8.*							t10	51.1	
11	-	8.*							t11	60.0	
12	-	8.*							t12	195.6	
13	-	8.*							t13	77.0	

0 1 2 3 4 5 6 7

1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	20	66.	5.	78.4
2	20	66.	5.	77.8
3	20	66.	5.	76.4
4	20	66.	5.	77.2
5	40	66.	5.	72.3
6	40	66.	5.	71.6
7	40	66.	5.	70.2
8	40	66.	5.	70.5
9	60	66.	5.	69.2
10	60	66.	5.	67.9
11	60	66.	5.	66.5
12	60	66.	5.	68.3
13	80	66.	5.	67.4
14	80	66.	5.	65.6
15	80	66.	5.	64.5
16	80	66.	5.	65.4
17	200	66.	5.	65.4
18	200	66.	5.	63.5
19	200	66.	5.	62.5
20	300	66.	5.	63.5
21	300	66.	5.	61.9
22	300	67.	5.	60.8
23	400	67.	5.	62.3
24	400	67.	5.	61.3
25	400	67.	5.	60.3
26	35	67.	500.	73.7

BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
1 1 1 1 1 1 1 1 1 1 1 1 1

CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
0. 0. 1. 5. 8. 8. 8. 8. 8. 8. 8. 8. 8.

```
Future, MF Lot 4, 3rd floor, 20 to 400 foot setback (MerMF43.fut)
T-I-15, 1
 15761 , 65 , 446 , 65 , 943 , 65
T-I-15, 2
 15761 , 65 , 446 , 65 , 943 , 65
L-Northbound, 1
N,91934.,20155,915,
N,92440.,19317,945,
N,92705.,18836,960,
N,92927.,18425,970,
N,93055.,18176,975,
N,93202.,17901,980,
N,93434.,17415,985,
N,93671.,16917,990,
N,93859.,16515,995,
L-Southbound, 2
N,91806.,20086,930,
N,92267.,19324,955,
N,92515.,18891,965,
N,92858.,18267,975,
N,93006.,18000,980,
N,93290.,17429,985,
N,93526.,16939,990,
N,93764.,16426,995,
B-Edge of Slope and Berm, 1 , 2 , 0 ,0
92456.,17332,1065,1065,t1
92657.,17474,1065,1065,t2
92860.,17474,1065,1065,t3
92928.,17498,1072,1073,t4
92907.,17621,1065,1073,t5
92887.,17663,1065,1073,t6
92625.,18090,1070,1078,t7
92451.,18306,1073,1081,t8
92299.,18471,1075,1083,t9
92229.,18585,1076,1084,t10
B-Top of Berm, 2 , 2 , 0 ,0
92229.,18585,1076,1084,t10
92185.,18611,1076,1084,t11
92125.,18612,1077,1085,t12
91942.,18543,1077,1085,t13
91904.,18476,1077,1085,t14
R, 1 , 66 ,5
92871,17652,1090.,20
R, 2 , 66 ,5
92609,18079,1095.,20
R, 3 , 66 ,5
92282,18461,1100.,20
R, 4 , 66 ,5
92152,18591,1102.,20
R, 5 , 66 ,5
92837,17629,1090.,40
R, 6 , 66 ,5
92576,18056,1095.,40
R, 7 , 66 ,5
92249,18438,1100.,40
R, 8 , 66 ,5
92153,18552,1101.,40
R, 9 , 66 ,5
92804,17606,1090.,60
R, 10 , 66 ,5
92543,18033,1095.,60
R, 11 , 66 ,5
92216,18415,1100.,60
```

```
R, 12 , 66 ,5
92150,18512,1102.,60
R, 13 , 66 ,5
92753,17614,1090.,80
R, 14 , 66 ,5
92510,18010,1095.,80
R, 15 , 66 ,5
92184,18393,1100.,80
R, 16 , 66 ,5
92137,18467,1101.,80
R, 17 , 66 ,5
92645,17674,1092.,200
R, 18 , 66 ,5
92460,17976,1095.,200
R, 19 , 66 ,5
92134,18358,1100.,200
R, 20 , 66 ,5
92495,17728,1093.,300
R, 21 , 66 ,5
92378,17919,1095.,300
R, 22 , 67 ,5
92052,18301,1100.,300
R, 23 , 67 ,5
92361,17755,1094.,400
R, 24 , 67 ,5
92295,17862,1095.,400
R, 25 , 67 ,5
92011,18273,1100.,400
K, 2
ALL,ALL
C,C
```

SOUND32 - RELEASE 07/30/91, MODIFIED 04/22/00

TITLE:
Future, MF Lot 4, 3rd floor, 20 to 400 foot setback (MerMF43.fut)

1

BARRIER DATA
****

BAR ELE	0	BARRIER HEIGHTS 1	2	3	4	5	6	7	BAR ID	LENGTH	TYPE
1	-	0.*							t1	246.1	
2	-	0.*							t2	203.0	
3	-	1.*							t3	72.6	
4	-	5.*							t4	124.8	
5	-	8.*							t5	46.5	
6	-	8.*							t6	501.0	
7	-	8.*							t7	277.4	
8	-	8.*							t8	224.4	
9	-	8.*							t9	133.8	
10	-	8.*							t10	51.1	
11	-	8.*							t11	60.0	
12	-	8.*							t12	195.6	
13	-	8.*							t13	77.0	
	0	1	2	3	4	5	6	7			

1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	20	66.	5.	82.2
2	20	66.	5.	81.7
3	20	66.	5.	80.2
4	20	66.	5.	78.9
5	40	66.	5.	77.2
6	40	66.	5.	76.3
7	40	66.	5.	75.1
8	40	66.	5.	76.1
9	60	66.	5.	73.4
10	60	66.	5.	72.3
11	60	66.	5.	71.0
12	60	66.	5.	72.8
13	80	66.	5.	70.7
14	80	66.	5.	68.7
15	80	66.	5.	67.8
16	80	66.	5.	69.3
17	200	66.	5.	67.8
18	200	66.	5.	65.6
19	200	66.	5.	64.9
20	300	66.	5.	64.9
21	300	66.	5.	63.2
22	300	67.	5.	62.5
23	400	67.	5.	63.5
24	400	67.	5.	62.4
25	400	67.	5.	61.8

BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
1 1 1 1 1 1 1 1 1 1 1 1 1

CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION

0. 0. 1. 5. 8. 8. 8. 8. 8. 8. 8. 8. 8.

```
                                                    MERRMF22
Meadow Park Lane 8,000 ADT Multi-Family Lot 22
T-Meadow Park Lane, 1
 394 , 30 , 4 , 30 , 2 , 30
T-Meadow Park Lane, 2
 394 , 30 , 4 , 30 , 2 , 30
L-Lane 1, 1
N,-2000.,6,905,
N,2000.,6,905,
L-Lane 2, 2
N,-2000.,-6,905,
N,2000.,-6,905,
B-Wall, 1 , 2 , 0 ,0
-2000.,25,905,911,
2000.,25,905,911,
R, 1 , 67 ,500
0,35,910.,MF 22
R, 2 , 67 ,500
0,40,910.,MF 22
R, 3 , 67 ,500
0,45,910.,MF 22
R, 4 , 67 ,500
0,50,910.,MF 22
R, 5 , 67 ,500
0,55,910.,MF 22
C,C
```

SOUND32 - RELEASE 07/30/91, MODIFIED 04/22/00

TITLE:
Meadow Park Lane 8,000 ADT Multi-Family Lot 22

1

BARRIER DATA
****

BAR ELE	BARRIER HEIGHTS 0	1	2	3	4	5	6	7	BAR ID	LENGTH	TYPE
1	-	6.*							B1 P1	4000.0	

1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	MF 22	67.	500.	57.3
2	MF 22	67.	500.	56.6
3	MF 22	67.	500.	56.1
4	MF 22	67.	500.	55.6
5	MF 22	67.	500.	55.1

BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
1
CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
6.

```
Merriam Mountains Parkway 7,730 ADT Lot 45, Worstcase N3, Mer45.mit
T-Merriam Mountains Parkway, 1
 381 , 40 , 4 , 40 , 2 , 40
T-Merriam Mountains Parkway, 2
 381 , 40 , 4 , 40 , 2 , 40
L-Lane 1, 1
N,-2000.,13,1312,
N,2000.,13,1312,
L-Lane 2, 2
N,-2000.,-13,1312,
N,2000.,-13,1312,
B-Wall, 1 , 2 , 0 ,0
-2000.,40,1312,1318,
2000.,40,1312,1318,
R, 1 , 67 ,500
0,50,1317.,Lot 45-1
R, 2 , 67 ,500
0,50,1327.,Lot 45-2
C,C
```

SOUND32 - RELEASE 07/30/91, MODIFIED 04/22/00

TITLE:
Merriam Mountains Parkway 7,730 ADT Lot 45, Worstcase N3, Mer45.mit

1

BARRIER DATA
****

BAR ELE	BARRIER HEIGHTS 0	1	2	3	4	5	6	7	BAR ID	LENGTH	TYPE
1	-	6.*							B1 P1	4000.0	

1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	Lot 45-1	67.	500.	59.0
2	Lot 45-2	67.	500.	65.7

BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
1
CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
6.

```
Merriam Mountains Parkway 6,040 ADT Lot 287, Worstcase N4a, Mer287.mit
T-Merriam Mountains Parkway, 1
 297 , 40 , 3 , 40 , 2 , 40
T-Merriam Mountains Parkway, 2
 297 , 40 , 3 , 40 , 2 , 40
L-Lane 1, 1
N,-2000.,13,1215,
N,2000.,13,1215,
L-Lane 2, 2
N,-2000.,-13,1215,
N,2000.,-13,1215,
B-Wall, 1 , 2 , 0 ,0
-2000.,80,1249,1255,
2000.,80,1249,1255,
R, 1 , 67 ,500
0,90,1254.,Lot287-1
R, 2 , 67 ,500
0,90,1264.,Lot287-2
C,C
```

```
Lot 126 Mitigated Cross Section 40 degree view of road (Mer126.mit)
T-I-15, 1
 15761 , 65 , 446 , 65 , 943 , 65
T-I-15, 2
 15761 , 65 , 446 , 65 , 943 , 65
L-Northbound, 1
N,-9999999.,70,853,n
N,9999999.,70,853,n
L-Southbound, 2
N,-999999.,-70,873,n
N,999999.,-70,873,
B-Wall, 1 , 2 , 0 ,0
-9999999.,1100,1291,1297,
9999999.,1100,1291,1297,
R, 1 , 67 ,500
0,1110,1296.,L126
K, 2
ALL,ALL
K,-6.5
ALL,1
C,C
```

SOUND32 - RELEASE 07/30/91, MODIFIED 04/22/00

TITLE:
Lot 126 Mitigated Cross Section 40 degree view of road (Mer126.mit)

1

BARRIER DATA
****

BAR ELE	BARRIER HEIGHTS 0	1	2	3	4	5	6	7	BAR ID	LENGTH	TYPE
1	-	6.*							B1 P1	********	

1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	L126	67.	500.	56.7

BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
1
CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
6.

SOUND32 - RELEASE 07/30/91, MODIFIED 04/22/00

TITLE:
Merriam Mountains Parkway 6,040 ADT Lot 287, Worstcase N4a, Mer287.mit

1

BARRIER DATA
****

BAR ELE	BARRIER HEIGHTS 0	1	2	3	4	5	6	7	BAR ID	LENGTH	TYPE
1	-	6.*							B1 P1	4000.0	

1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	Lot287-1	67.	500.	50.2
2	Lot287-2	67.	500.	61.5

BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
1
CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
6.

```
Merriam Mountains Parkway 5,300 ADT Lot 618, Worstcase N4b, Mer618.mit
T-Merriam Mountains Parkway, 1
 261 , 40 , 3 , 40 , 1 , 40
T-Merriam Mountains Parkway, 2
 261 , 40 , 3 , 40 , 1 , 40
L-Lane 1, 1
N,-2000.,13,1238,
N,2000.,13,1238,
L-Lane 2, 2
N,-2000.,-13,1238,
N,2000.,-13,1238,
B-Wall, 1 , 2 , 0 ,0
-2000.,35,1238,1244,
2000.,35,1238,1244,
R, 1 , 67 ,500
0,45,1243.,Lot618-1
R, 2 , 67 ,500
0,45,1253.,Lot618-2
C,C
```

SOUND32 - RELEASE 07/30/91, MODIFIED 04/22/00

TITLE:
Merriam Mountains Parkway 5,300 ADT Lot 618, Worstcase N4b, Mer618.mit

1

BARRIER DATA
****

BAR ELE	BARRIER HEIGHTS 0	1	2	3	4	5	6	7	BAR ID	LENGTH	TYPE
1	-	6.*							B1 P1	4000.0	

1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	Lot618-1	67.	500.	57.4
2	Lot618-2	67.	500.	64.4

BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
1

CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
6.

```
Estaete Lots 1175-1177 Future (Merelot.fut) I-15 pavement +2, K cal= -2. =0
T-I-15, 1
 15761 , 65 , 446 , 65 , 943 , 65
T-I-15, 2
 15761 , 65 , 446 , 65 , 943 , 65
L-Northbound, 1
N,6286717.6,2031424,565,
N,6286989.6,2030652,570,
N,6287144.0,2030210,575,
N,6287409.7,2029455,580,
L-Northbound, 2
N,6286559.3,2031419,585,
N,6286812.2,2030699,590,
N,6287055.1,2030010,595,
N,6287339.4,2029204,600,
B-Pad at Lot 1175, 1 , 2 , 0 ,0
6286091.26,2030273,749,749,
6286215.93,2030409,749,749,
6286248.23,2030423,749,749,
6286299.55,2030455,749,749,
6286288.65,2030491,749,749,
6286215.64,2030562,749,749,
6286190.57,2030564,749,749,
6286179.97,2030553,749,749,
B-Pad at Lot 1176, 2 , 2 , 0 ,0
6286111.25,2030576,756,756,
6286143.05,2030587,756,756,
6286149.88,2030587,756,756,
6286141.27,2030687,756,756,
6286073.24,2030681,756,756,
6286039.90,2030694,756,756,
B-Existing Topo, 3 , 2 , 0 ,0
6286857.11,2030010,600,600,
6286739.02,2030120,625,625,
6286617.07,2030230,650,650,
6286498.98,2030299,675,675,
6286414.85,2030369,700,700,
6286346.16,2030435,725,725,
6286299.5,2030455,749,749,
B-Existing Topo, 4 , 2 , 0 ,0
6286129.5,2030850,760,760,
6286160.3,2030949,780,780,
6286168.8,2031043,780,780,
B-Existing Topo, 5 , 2 , 0 ,0
6286713.28,2030575,600,600,
6286603.74,2030713,625,625,
6286516.89,2030795,650,650,
6286442.88,2030834,675,675,
6286406.37,2030881,700,700,
6286368.87,2030936,725,725,
6286295.84,2030970,750,750,
6286212.95,2030995,775,775,
B-Pad at Lot 1177, 6 , 2 , 0 ,0
6286053.67,2030736,753,753,
6286127.29,2030810,753,753,
6286099.13,2030856,753,753,
R, 1 , 67 ,500
6286210,2030417,754.,L 1175
R, 2 , 67 ,500
6286243,2030431,754.,L 1175
R, 3 , 67 ,500
6286287,2030459,754.,L 1175
R, 4 , 67 ,500
```

```
6286279,2030485,754.,L 1175
R, 5 , 67 ,500
6286211,2030552,754.,L 1175
R, 6 , 67 ,500
6286194,2030553,754.,L 1175
R, 7 , 67 ,500
6286187,2030546,754.,L 1175
R, 8 , 67 ,500
6286107,2030585,761.,L 1176
R, 9 , 67 ,500
6286139,2030596,761.,L 1176
R, 10 , 67 ,500
6286132,2030676,761.,L 1176
R, 11 , 67 ,500
6286071,2030671,761.,L 1176
R, 12 , 67 ,500
6286036,2030684,761.,L 1176
R, 13 , 67 ,500
6286046,2030743,758.,L 1177
R, 14 , 67 ,500
6286114,2030811,758.,L 1177
R, 15 , 67 ,500
6286090,2030850,758.,L 1177
R, 16 , 67 ,500
6286285,2030460,754.,Site 1
C,C
```

SOUND32 - RELEASE 07/30/91, MODIFIED 04/22/00

TITLE:
Estaete Lots 1175-1177 Future (Merelot.fut) I-15 pavement +2, K cal= -2. =0

1

BARRIER DATA
****

BAR ELE	0	1	2	3	4	5	6	7	BAR ID	LENGTH	TYPE
1	-	0.*							B1 P1	184.4	
2	-	0.*							B1 P2	34.9	
3	-	0.*							B1 P3	60.6	
4	-	0.*							B1 P4	37.6	
5	-	0.*							B1 P5	101.8	
6	-	0.*							B1 P6	25.1	
7	-	0.*							B1 P7	15.2	
8	-	0.*							B2 P1	33.8	
9	-	0.*							B2 P2	7.0	
10	-	0.*							B2 P3	100.4	
11	-	0.*							B2 P4	68.8	
12	-	0.*							B2 P5	35.5	
13	-	0.*							B3 P1	163.2	
14	-	0.*							B3 P2	166.2	
15	-	0.*							B3 P3	139.0	
16	-	0.*							B3 P4	112.2	
17	-	0.*							B3 P5	98.7	
18	-	0.*							B3 P6	56.0	
19	-	0.*							B4 P1	105.7	
20	-	0.*							B4 P2	94.4	
21	-	0.*							B5 P1	178.2	
22	-	0.*							B5 P2	121.8	
23	-	0.*							B5 P3	87.3	
24	-	0.*							B5 P4	64.5	
25	-	0.*							B5 P5	71.1	
26	-	0.*							B5 P6	84.3	
27	-	0.*							B5 P7	90.2	
28	-	0.*							B6 P1	104.7	
29	-	0.*							B6 P2	54.1	
	0	1	2	3	4	5	6	7			

1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	L 1175	67.	500.	70.0
2	L 1175	67.	500.	71.1
3	L 1175	67.	500.	74.4
4	L 1175	67.	500.	74.7
5	L 1175	67.	500.	72.2
6	L 1175	67.	500.	68.9
7	L 1175	67.	500.	67.0
8	L 1176	67.	500.	65.3

```
 9  L 1176     67.     500.    72.5
10  L 1176     67.     500.    73.1
11  L 1176     67.     500.    63.3
12  L 1176     67.     500.    63.4
13  L 1177     67.     500.    69.4
14  L 1177     67.     500.    71.5
15  L 1177     67.     500.    68.0
16  Site 1     67.     500.    73.2
BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1
  1  1  1  1
CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
 0. 0. 0. 0.
```

```
Estate Lots 1175-1177 Mitigat (Merelot.mit) I-15 pavement +2, K cal= -2. =0
T-I-15, 1
 15761 , 65 , 446 , 65 , 943 , 65
T-I-15, 2
 15761 , 65 , 446 , 65 , 943 , 65
L-Northbound, 1
N,6286717.6,2031424,565,
N,6286989.6,2030652,570,
N,6287144.0,2030210,575,
N,6287409.7,2029455,580,
L-Northbound, 2
N,6286559.3,2031419,585,
N,6286812.2,2030699,590,
N,6287055.1,2030010,595,
N,6287339.4,2029204,600,
B-Wall at Lot 1175, 1 , 2 , 0 ,0
6286091.26,2030273,749,757,
6286215.93,2030409,749,759,
6286248.23,2030423,749,759,
6286299.55,2030455,749,759,
6286288.65,2030491,749,759,
6286215.64,2030562,749,759,
6286190.57,2030564,749,755,
6286179.97,2030553,749,755,
B-Wall at Lot 1176, 2 , 2 , 0 ,0
6286111.25,2030576,756,762,
6286143.05,2030587,756,765,
6286149.88,2030587,756,765,
6286141.27,2030687,756,765,
6286073.24,2030681,756,762,
6286039.90,2030694,756,762,
B-Existing Topo, 3 , 2 , 0 ,0
6286857.11,2030010,600,600,
6286739.02,2030120,625,625,
6286617.07,2030230,650,650,
6286498.98,2030299,675,675,
6286414.85,2030369,700,700,
6286346.16,2030435,725,725,
6286299.5,2030455,749,749,
B-Existing Topo, 4 , 2 , 0 ,0
6286129.5,2030850,760,760,
6286160.3,2030949,780,780,
6286168.8,2031043,780,780,
B-Existing Topo, 5 , 2 , 0 ,0
6286713.28,2030575,600,600,
6286603.74,2030713,625,625,
6286516.89,2030795,650,650,
6286442.88,2030834,675,675,
6286406.37,2030881,700,700,
6286368.87,2030936,725,725,
6286295.84,2030970,750,750,
6286212.95,2030995,775,775,
B-Wall at Lot 1177, 6 , 2 , 0 ,0
6286053.67,2030736,753,761,
6286127.29,2030810,753,761,
6286099.13,2030856,753,761,
R, 1 , 67 ,500
6286210,2030417,754.,L 1175
R, 2 , 67 ,500
6286243,2030431,754.,L 1175
R, 3 , 67 ,500
6286287,2030459,754.,L 1175
R, 4 , 67 ,500
```

```
6286279,2030485,754.,L 1175
R, 5 , 67 ,500
6286211,2030552,754.,L 1175
R, 6 , 67 ,500
6286194,2030553,754.,L 1175
R, 7 , 67 ,500
6286187,2030546,754.,L 1175
R, 8 , 67 ,500
6286107,2030585,761.,L 1176
R, 9 , 67 ,500
6286139,2030596,761.,L 1176
R, 10 , 67 ,500
6286132,2030676,761.,L 1176
R, 11 , 67 ,500
6286071,2030671,761.,L 1176
R, 12 , 67 ,500
6286036,2030684,761.,L 1176
R, 13 , 67 ,500
6286046,2030743,758.,L 1177
R, 14 , 67 ,500
6286114,2030811,758.,L 1177
R, 15 , 67 ,500
6286090,2030850,758.,L 1177
R, 16 , 67 ,500
6286285,2030460,754.,Site 1
C,C
```

SOUND32 - RELEASE 07/30/91, MODIFIED 04/22/00

TITLE:
Estate Lots 1175-1177 Mitigat (Merelot.mit) I-15 pavement +2, K cal= -2. =0

1

BARRIER DATA
****

BAR ELE	BARRIER HEIGHTS 0	1	2	3	4	5	6	7	BAR ID	LENGTH	TYPE
1	-	9.*							B1 P1	184.4	
2	-	10.*							B1 P2	34.9	
3	-	10.*							B1 P3	60.6	
4	-	10.*							B1 P4	37.6	
5	-	10.*							B1 P5	101.8	
6	-	8.*							B1 P6	25.4	
7	-	6.*							B1 P7	15.2	
8	-	8.*							B2 P1	34.0	
9	-	9.*							B2 P2	7.0	
10	-	9.*							B2 P3	100.4	
11	-	8.*							B2 P4	68.8	
12	-	6.*							B2 P5	35.5	
13	-	0.*							B3 P1	163.2	
14	-	0.*							B3 P2	166.2	
15	-	0.*							B3 P3	139.0	
16	-	0.*							B3 P4	112.2	
17	-	0.*							B3 P5	98.7	
18	-	0.*							B3 P6	56.0	
19	-	0.*							B4 P1	105.7	
20	-	0.*							B4 P2	94.4	
21	-	0.*							B5 P1	178.2	
22	-	0.*							B5 P2	121.8	
23	-	0.*							B5 P3	87.3	
24	-	0.*							B5 P4	64.5	
25	-	0.*							B5 P5	71.1	
26	-	0.*							B5 P6	84.3	
27	-	0.*							B5 P7	90.2	
28	-	8.*							B6 P1	104.7	
29	-	8.*							B6 P2	54.1	
	0	1	2	3	4	5	6	7			

1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	L 1175	67.	500.	58.3
2	L 1175	67.	500.	58.8
3	L 1175	67.	500.	59.5
4	L 1175	67.	500.	59.6
5	L 1175	67.	500.	59.3
6	L 1175	67.	500.	59.8
7	L 1175	67.	500.	59.4
8	L 1176	67.	500.	58.9

```
 9  L 1176     67.     500.    59.6
10  L 1176     67.     500.    59.6
11  L 1176     67.     500.    58.4
12  L 1176     67.     500.    59.4
13  L 1177     67.     500.    59.0
14  L 1177     67.     500.    60.2
15  L 1177     67.     500.    59.9
16  Site 1     67.     500.    59.7
BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1  1
  1  1  1  1
CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
 9.10.10.10.10. 8. 6. 8. 9. 9. 8. 6. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0. 0.
 0. 0. 8. 8.
```

```
Merriam--Multi family Lots 15 and 17 along Deer Springs, (MERMFDS.fut)
T-Deer Springs Road, 1
 2165 , 55 , 45 , 55 , 45 , 55
T-Deer Springs Road, 2
 2165 , 55 , 45 , 55 , 45 , 55
L-Eastbound, 1
N,6286339.,2015523,781,
N,6286452.,2015527,785,
N,6286621.,2015534,790,
N,6286785.,2015541,795,
N,6286951.,2015548,800,
N,6287112.,2015554,805,
N,6287405.,2015568,810,
N,6287818.,2015592,810,
N,6288305.,2015600,810,
L-Westbound, 2
N,6286337.,2015565,781,
N,6286451.,2015569,785,
N,6286619.,2015576,790,
N,6286783.,2015583,795,
N,6286949.,2015590,800,
N,6287111.,2015596,805,
N,6287402.,2015609,810,
N,6287817.,2015634,810,
N,6288305.,2015642,810,
B-Slope MF Lot 19, 1 , 2 , 0 ,0
6286855,2015775,820,820,
6286866,2015642,815,815,
6287050,2015642,815,815,
6287050,2015854,820,820,
B-Slope MF Lot 17, 2 , 2 , 0 ,0
6287165,2015835,830,830,
6287192,2015679,830,830,
6287412,2015682,830,830,
6287413,2015765,835,835,
6287414,2015957,840,840,
R, 1 , 67 ,500
6286952,2015652,820.,Lot17-10
R, 2 , 67 ,500
6286952,2015662,820.,Lot17-20
R, 3 , 67 ,500
6286952,2015672,820.,Lot17-30
R, 4 , 67 ,500
6286952,2015682,820.,Lot17-40
R, 5 , 67 ,500
6286952,2015692,820.,Lot17-50
R, 6 , 67 ,500
6286952,2015702,820.,Lot17-60
R, 7 , 67 ,500
6286952,2015712,820.,Lot17-70
R, 8 , 67 ,500
6287303,2015690,835.,Lot15-10
R, 9 , 67 ,500
6287303,2015700,835.,Lot15-20
R, 10 , 67 ,500
6287303,2015710,835.,Lot15-30
R, 11 , 67 ,500
6287303,2015720,835.,Lot15-40
R, 12 , 67 ,500
6287303,2015730,835.,Lot15-50
C,C
```

SOUND32 - RELEASE 07/30/91, MODIFIED 04/22/00

TITLE:
Merriam--Multi family Lots 15 and 17 along Deer Springs, (MERMFDS.fut)

1

BARRIER DATA
****

BAR ELE	0	1	2	3	4	5	6	7	BAR ID	LENGTH	TYPE
1	-	0.*							B1 P1	133.5	
2	-	0.*							B1 P2	184.0	
3	-	0.*							B1 P3	212.1	
4	-	0.*							B2 P1	158.3	
5	-	0.*							B2 P2	220.0	
6	-	0.*							B2 P3	83.2	
7	-	0.*							B2 P4	192.1	
	0	1	2	3	4	5	6	7			

1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	Lot17-10	67.	500.	73.7
2	Lot17-20	67.	500.	70.4
3	Lot17-30	67.	500.	69.1
4	Lot17-40	67.	500.	68.0
5	Lot17-50	67.	500.	67.1
6	Lot17-60	67.	500.	66.4
7	Lot17-70	67.	500.	65.7
8	Lot15-10	67.	500.	72.7
9	Lot15-20	67.	500.	69.2
10	Lot15-30	67.	500.	67.9
11	Lot15-40	67.	500.	66.7
12	Lot15-50	67.	500.	65.7

BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
1 1 1 1 1 1 1
CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
0. 0. 0. 0. 0. 0. 0.

```
Merriam--Multi family Lots 15 and 17 along Deer Springs, (MERMFDS.mit)
T-Deer Springs Road, 1
 2165 , 55 , 45 , 55 , 45 , 55
T-Deer Springs Road, 2
 2165 , 55 , 45 , 55 , 45 , 55
L-Eastbound, 1
N,6286339.,2015523,781,
N,6286452.,2015527,785,
N,6286621.,2015534,790,
N,6286785.,2015541,795,
N,6286951.,2015548,800,
N,6287112.,2015554,805,
N,6287405.,2015568,810,
N,6287818.,2015592,810,
N,6288305.,2015600,810,
L-Westbound, 2
N,6286337.,2015565,781,
N,6286451.,2015569,785,
N,6286619.,2015576,790,
N,6286783.,2015583,795,
N,6286949.,2015590,800,
N,6287111.,2015596,805,
N,6287402.,2015609,810,
N,6287817.,2015634,810,
N,6288305.,2015642,810,
B-Slope MF Lot 19, 1 , 2 , 0 ,0
6286855,2015775,820,828,
6286866,2015642,815,823,
6287050,2015642,815,823,
6287050,2015854,820,828,
B-Slope MF Lot 17, 2 , 2 , 0 ,0
6287165,2015835,830,838,
6287192,2015679,830,838,
6287412,2015682,830,838,
6287413,2015765,835,843,
6287414,2015957,840,848,
R, 1 , 67 ,500
6286952,2015652,820.,Lot17-10
R, 2 , 67 ,500
6286952,2015662,820.,Lot17-20
R, 3 , 67 ,500
6286952,2015672,820.,Lot17-30
R, 4 , 67 ,500
6286952,2015682,820.,Lot17-40
R, 5 , 67 ,500
6286952,2015692,820.,Lot17-50
R, 6 , 67 ,500
6286952,2015702,820.,Lot17-60
R, 7 , 67 ,500
6286952,2015712,820.,Lot17-70
R, 8 , 67 ,500
6287303,2015690,835.,Lot15-10
R, 9 , 67 ,500
6287303,2015700,835.,Lot15-20
R, 10 , 67 ,500
6287303,2015710,835.,Lot15-30
R, 11 , 67 ,500
6287303,2015720,835.,Lot15-40
R, 12 , 67 ,500
6287303,2015730,835.,Lot15-50
C,C
```

SOUND32 - RELEASE 07/30/91, MODIFIED 04/22/00

TITLE:
Merriam--Multi family Lots 15 and 17 along Deer Springs, (MERMFDS.mit)

1

BARRIER DATA
****

BAR ELE	0	1	2	3	4	5	6	7	BAR ID	LENGTH	TYPE
1	-	8.*							B1 P1	133.5	
2	-	8.*							B1 P2	184.0	
3	-	8.*							B1 P3	212.1	
4	-	8.*							B2 P1	158.3	
5	-	8.*							B2 P2	220.0	
6	-	8.*							B2 P3	83.2	
7	-	8.*							B2 P4	192.1	
	0	1	2	3	4	5	6	7			

1

REC	REC ID	DNL	PEOPLE	LEQ(CAL)
1	Lot17-10	67.	500.	63.3
2	Lot17-20	67.	500.	62.7
3	Lot17-30	67.	500.	62.1
4	Lot17-40	67.	500.	61.5
5	Lot17-50	67.	500.	61.0
6	Lot17-60	67.	500.	60.4
7	Lot17-70	67.	500.	59.9
8	Lot15-10	67.	500.	61.7
9	Lot15-20	67.	500.	61.1
10	Lot15-30	67.	500.	60.4
11	Lot15-40	67.	500.	59.7
12	Lot15-50	67.	500.	59.2

BARRIER HEIGHT INDEX FOR EACH BARRIER SECTION
1 1 1 1 1 1 1
CORRESPONDING BARRIER HEIGHTS FOR EACH SECTION
8. 8. 8. 8. 8. 8. 8.

ATTACHMENT 3

Worst-Case Blasting/Drilling Noise

ATTACHMENT 3
WORST-CASE BLASTING/DRILLING NOISE

Blasting and Drilling Source Noise Levels (A-Weighted)

Drill L_{max} = 98 dB at 50 feet.
Blast L_{max} = 94 dB at 50 feet. For a blast L_{max} is approximately equal to SEL.
L_{eq} (1) = SEL + 10 log N - 10 log (t). For 1-hour t = 3600 seconds
Blast L_{eq} (1) = [94 +10 log 2 -10 log (3600)] = 61.4 dB (Assumes two blasts per hour).

Drilling + Blasting Noise L_{eq} (1) 98 + 61.4 = 98 dB at 50 feet
84dB L_{eq} (8) at 250 feet
(Assumes drilling lasts eight-hours at maximum noise level and two blasts per day).

Barrier Attenuation Calculation for Drilling Equipment
(Assume drill rig generates 89 at 50 feet)
Source to Barrier = 20 feet
Barrier to Receiver = 30 feet
Source Elevation = 10 feet for source height
Receiver Elevation = 5 feet for receiver height

Barrier Height	Barrier Attenuation	Mitigated A-weighted Noise Level
14 feet	14 dB	89 dB – 14 dB = 75 dB L_eq (1)
12 feet	11 dB	89 dB – 11 dB = 78 dB L_{eq} (1)
10 feet	7 dB	89 dB – 7 dB = 82 dB L_{eq} (1)
8 feet	0 dB	89 dB – 0 dB = 89 dB L_{eq} (1)

INTENTIONALLY LEFT BLANK